- Bowaters' Catawba mill
- Latex adhesives
- Dust removal in paper converting
- Buckeye's forestry management

The Paper Industry

Publishers of PAPER AND PULP MILL CATALOGUE

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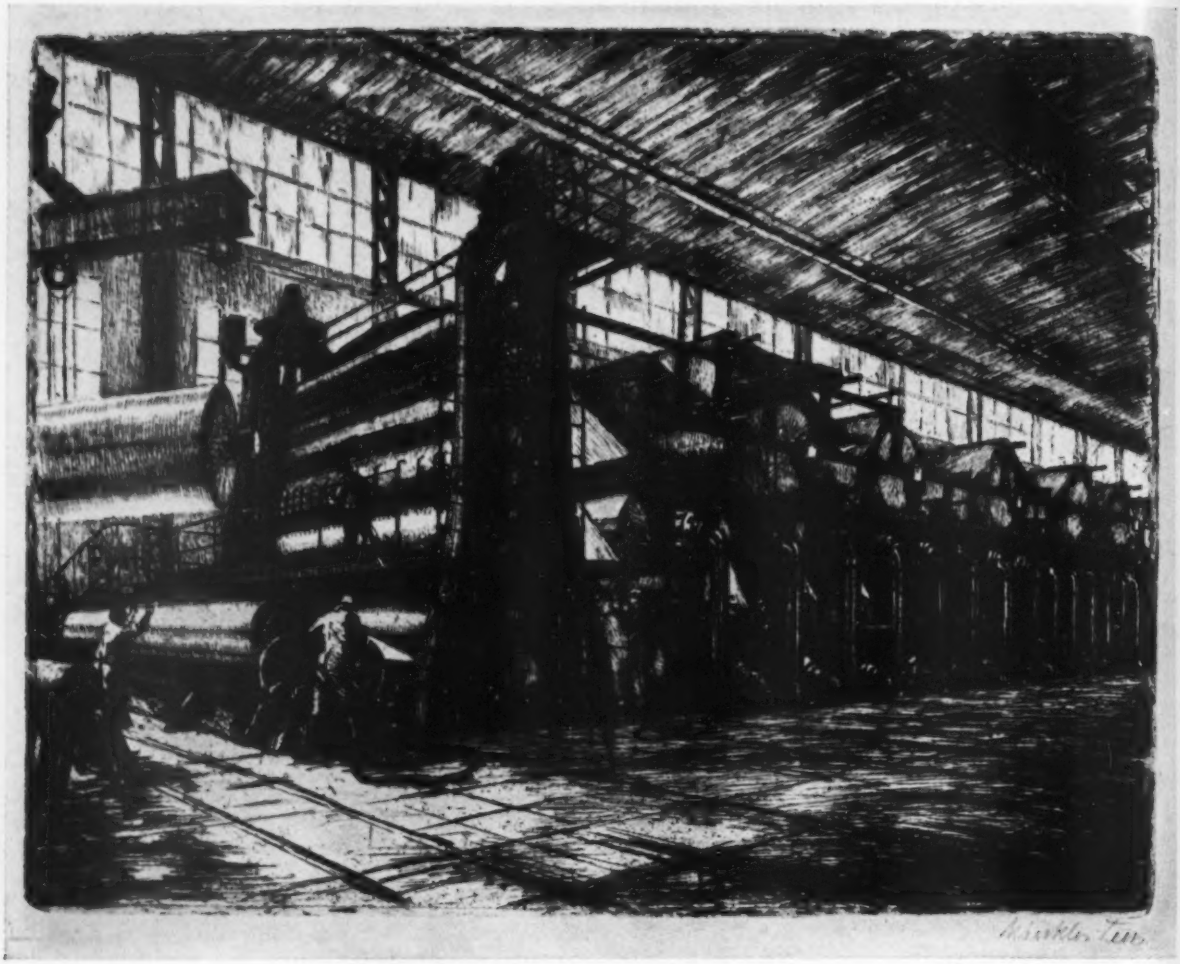
Bowaters Carolina Corp.'s new sulfate pulp mill. See page 626.

Our 41st Year" December 1959



"Dry End" **Original etching by Paul Winkler-Leers from the Asten-Hill collection.**

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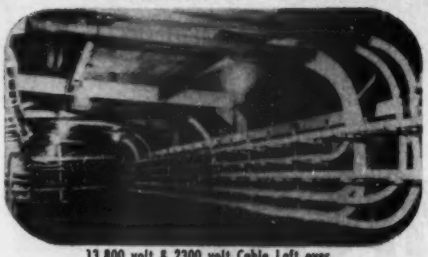

13,800 volt & 2300 volt Cable Loft over Circuit Breakers in Powerhouse

2300 volt Control Cubicles for Paper Machine

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Each electrical contracting job presents its own unique problems. This project called for the modernization of plant, and the correction of continuing electrical power failures due to corrosion and other factors which were causing a large drop in production. An engineering study was made by us of the entire electrical power and distribution system. Precision operation was effected by the design and construction of centralized power control stations. These were housed in chambers filled with purified air under pressure—a forerunner of existing air conditioning methods. Protective equipment and circuitry was installed. Cable specifications were rewritten which extended the corrosion-resistant qualities and life of the cables. A shift to a 13.2 kv power distribution system was initiated and the existing 2300 v equipment was redesigned to tie-in to this new system.

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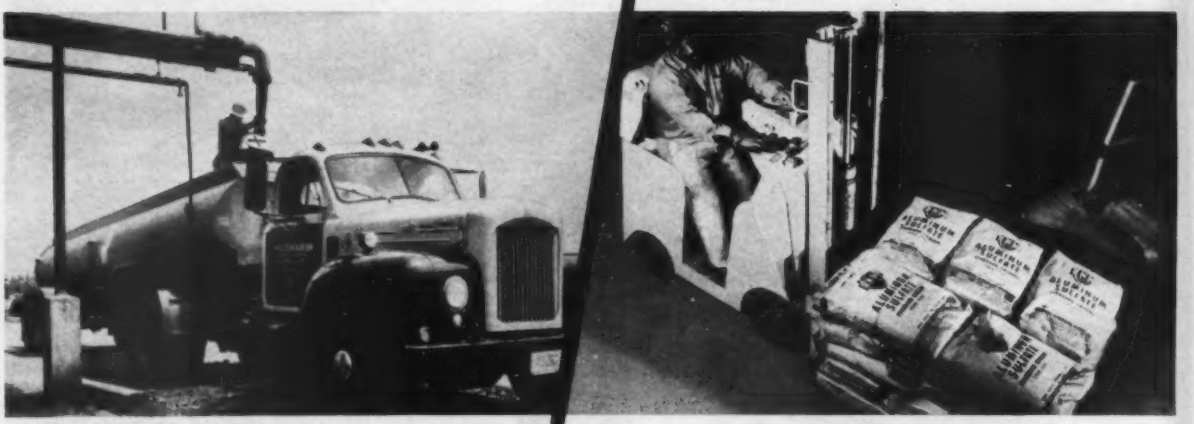

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The Paper Industry

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VOLUME 41 **NUMBER 9** **DECEMBER 1959**

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Fritz Publications and its staff extend their readers and advertisers A Merry Christmas and best wishes for a prosperous and Happy New Year

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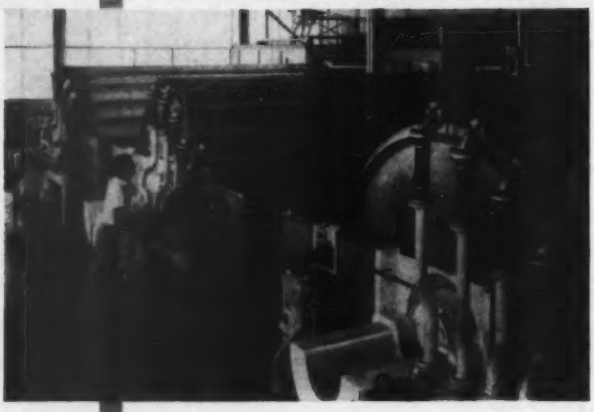
SANDY HILL IS PROUD

Bowaters Chose SANDY HILL – Kamyr Components

Bowaters' Wet Machine with Sandy Hill — Kamyr Feltless Presses and Predryers.



Bowaters' three Sandy Hill-Kamyr Vacuum Washers, part of the three-stage Kamyr bleach plant system.

Sandy Hill Iron and Brass Works congratulates Bowaters Carolina Corporation on the completion of its revolutionary new pulp mill at Catawba, South Carolina, and Sandy Hill is proud of the part it was privileged to play in the successful operation.

The three-stage bleach plant system, including the bleach tower equipment, is a Sandy Hill installation. The bleach system consists of chlorination, caustic and calcium hypochlorite. Kamyr's proved capability of producing superior quality, bright and strong pulp has resulted in more mills throughout the world bleaching pulp the Kamyr way than by any other method.

Sandy Hill bleach components at Catawba include three vacuum washers, steam mixers, circulation pumps and scrapers.

The Sandy Hill-Kamyr wet machine has two heavy presses with a set of Sandy Hill predryers between them. Advantages of the Kamyr wet machine include higher production of dryer pulp, elimination of felts, lower capital expenditure and maintenance costs, and smaller space requirements.

Write for folders describing in detail:

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PULP BLEACHING EQUIPMENT

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From our point of view..

Why support "The Paper Industry"?

It is in line with the approaching festive season that man is prompted to share and identify his problems, hopes and aspirations with those of his fellow men, neighbors, friends and associates. It may also be an appropriate time for an editor to re-examine the status of his contact with his readers, share his problems, explain the publication's editorial objectives, and invite the readers' cooperation in attaining these objectives.

We are fully aware of the universal complaint of the insufficiency of time to read all publications in the field of one's interest. And yet, it is only through a special effort of keeping fully informed that it is possible for anyone to render those vital services that fall into the category of major contribution to the growth of one's company or profession.

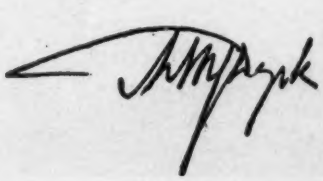
In view of the wealth of information now being disseminated, no single publication has the capacity of presenting a complete and exclusive diet for its many readers. With the realization that it would be preposterous for any medium to claim a clear-cut pre-eminence in the dissemination of information, this publication has always been reluctant to proclaim itself the most useful or the most widely read in its field. We are also convinced that no responsible or discerning reader could truthfully concede such a tribute to any publication. Such understandable reluctance of reader participation, we consider a major weakness in all readership survey undertakings.

The usefulness of any industrial publication is commensurate with the quality of the service it provides. The requirement here, as we see it, is not so much that of winning the race of coming out first with an article featuring a certain new development, but to present it lucidly and with considerable detail with regard to information that is vital to the readers, and with considerably less detail where it concerns generalities and other non-essential material.

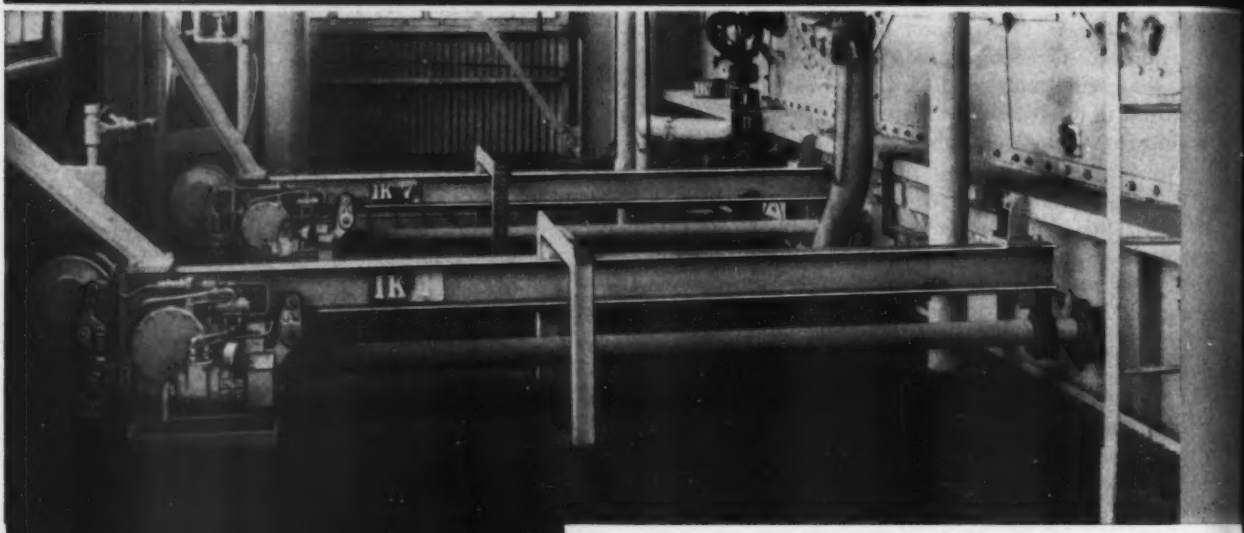
In line with the above considerations, we refrain for instance from reproducing straight releases on new mill start-ups supplied by the companies concerned — even at the cost of being "scooped" by other publications. Our mill stories are carefully prepared to include a maximum of technical detail on the new equipment installed. For our readers' convenience, we aso refrain from identifying, in the text, any equipment with the manufacturer's name, but accomplish this more effectively in the appended list of equipment which in itself serves as an at-a-glance summary of the story. In line with these considerations, we also process all our articles with the view to retaining useful details and eliminating generalities and redundancies.

It is only through maximum enlightenment, in both the sciences and the humanities, that any nation can acquire the wisdom needed to progress toward the individual as well as the corporate freedoms to which we all aspire but which are being threatened by the ever-growing complexities of our social system as well as by a number of modern philosophies.

We as a publication pledge ourselves to render a service of enlightenment within the scope of the industry we serve. But we cannot do this alone. We need the support, the cooperation and the understanding of our readers.



SAVED $80 TO $100 PER DAY
Operating and Shutdown Costs by Modernizing Boiler Cleaning



Diamond Control Panel of the type installed in this modernization program. Blowing is initiated by moving the control lever to the bottom of the slot. The panel then operates each blower in sequence. Cleaning is complete and thorough every time.

Modernization of the boiler cleaning included installation of Diamond IK Long Retracting Blowers in strategic locations. A Diamond Automatic Program Panel was installed for control of all retracting blowers.

Hand lancing is now completely eliminated and new standards have been set for furnace cleanliness.

After the desired blowing cycle is set up on the Diamond Control Panel the system is placed in operation. Each retracting blower is operated automatically in sequence. A thorough cleaning job is assured every time—no blower can be missed.

Previous to this modernization, passages sometimes plugged so seriously that a positive furnace pressure occurred and gas puffed out at every

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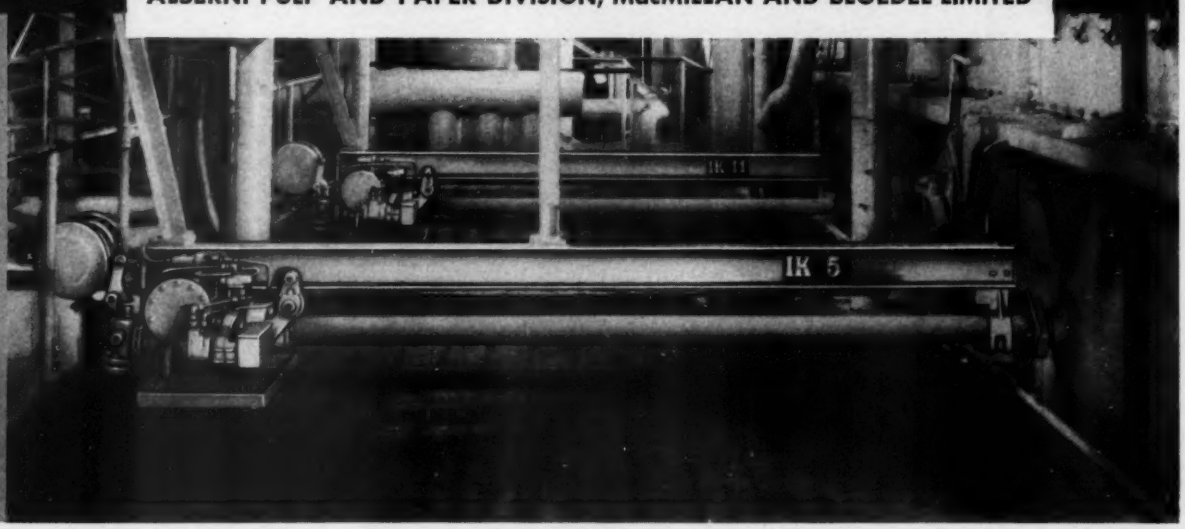

Some of the Diamond IK Long Retracting Blowers installed in the Port Alberni Plant Modernization Program.

available opening. Now this does not occur. Elimination of the deposits causing the plugging made a substantial improvement in efficiency and made working conditions more comfortable for the operators.

At the Harmac Plant of the same company, a similar modernization with Diamond Blowers also produced satisfactory results.

A Boiler Cleaning Modernization Program often saves many times its cost. In addition to more efficient fuel utilization and increased capacity, maintenance and operating costs are reduced when modern motorized units and automatic controls are installed. Even though your soot blower system was the best available at the time it was installed, improvements in cleaning technics have been made since then therefore a thorough modernization of your equipment will pay off. For many years, Diamond's aggressive research program has brought continuous improvement.

Get a survey of your boiler cleaning. Ask the nearest Diamond office (or write directly to Lancaster, Ohio). Savings available may surprise you.

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***Check your Acme Idea Man** for the latest strapping ideas. Or write Dept. PKS-129, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Limited, 743 Warden Avenue, Toronto 13, Ontario.

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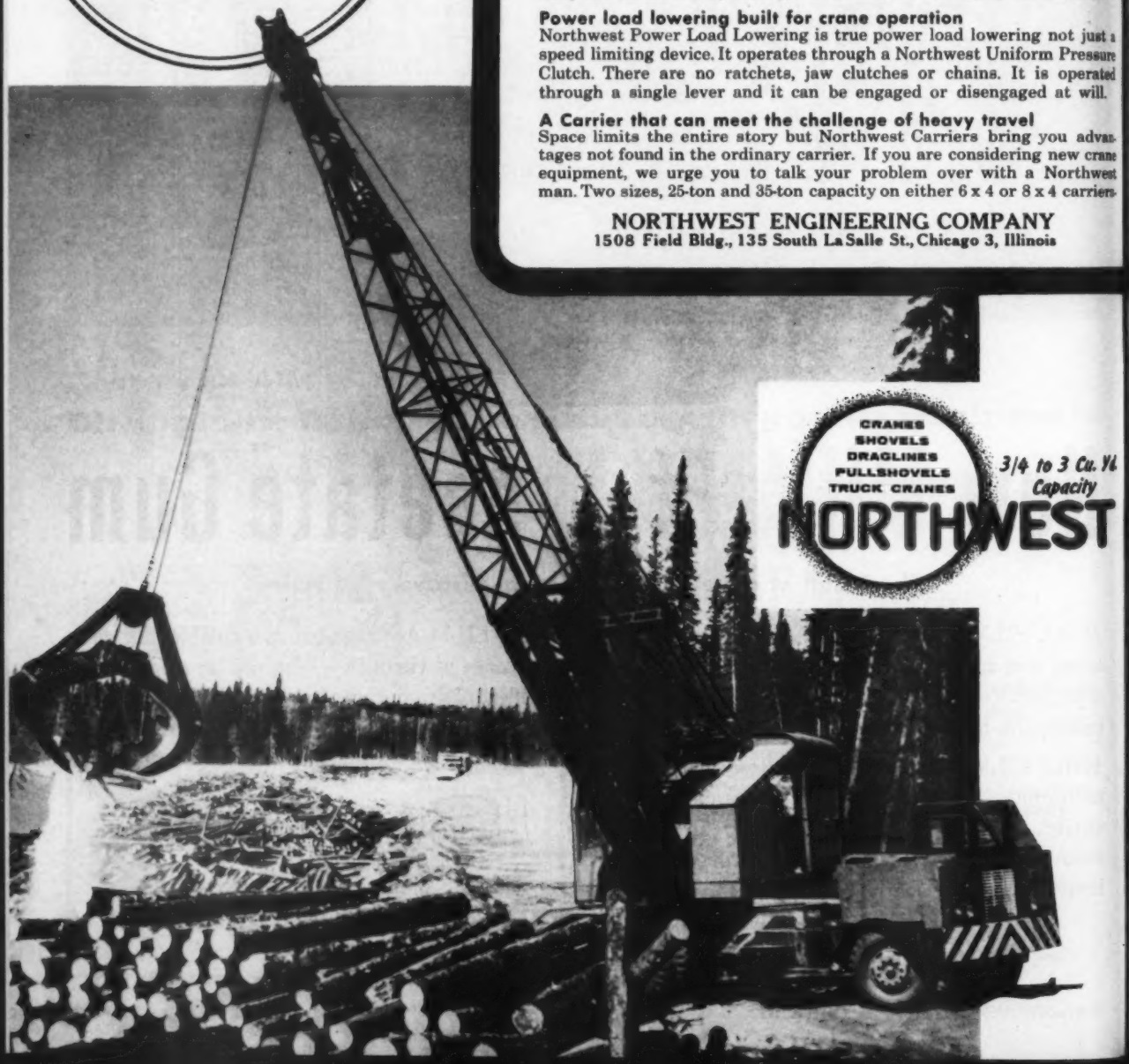

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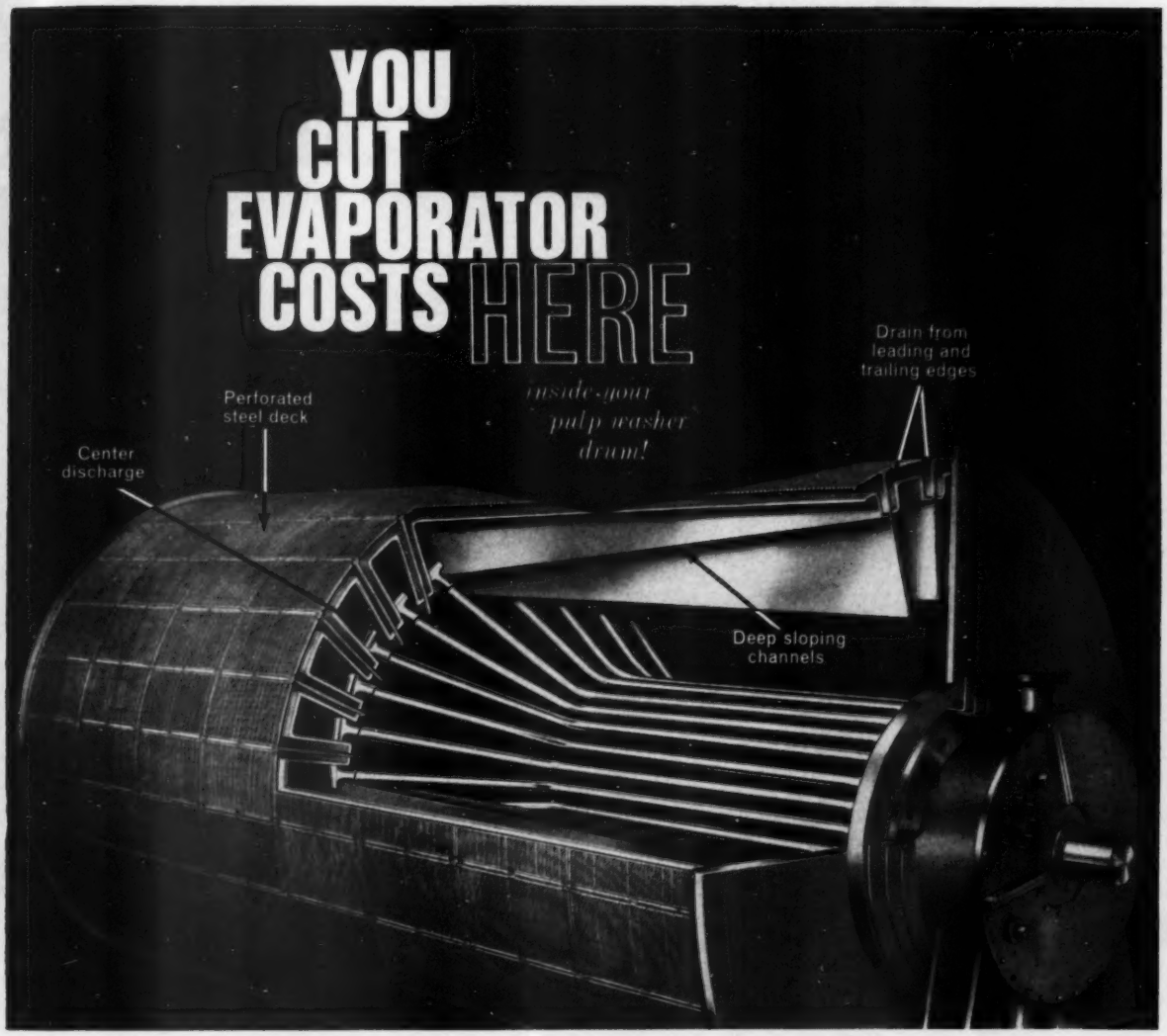

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Swenson pulp washers pick up a thicker sheet of pulp, permitting lower drum speeds and greater drainage time. The patented Swenson channels are sloped to the center with liquor drainage on both the leading and trailing sides. These features provide the most effective use of the drum area assuring low dilution operation.

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SF FLAKT DRYER, type L

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Feature articles

Bowaters' Catawba mill now in full operation

A. W. J. DYCK

Highlight of the new mill is the 500-ton per day capacity, airborne-web type pulp dryer installed by American SF Products Inc.

BOWATERS CAROLINA CORP.'S new sulfate pulp mill went into full production at Catawba, S. C., in July. Its main purpose is to supply Bowaters' expanding paper mills in England with the urgently needed pulp.

The new mill was engineered and its construction supervised by Bowaters Engineering and Development Inc., whose engineers were constantly in contact with the general contractor, Daniel Construction Company.

The site at Catawba, S. C., was selected in view of its advantages of good supply of water, wood, power and transportation facilities.

The new mill's daily consumption of chemicals and raw materials is: 20 tons of salt cake, 25 tons of chlorine, 10 tons of caustic soda, 18 tons of lime, and 800 cords of pulpwood in the form of pine. The latter is obtained from the Piedmont areas of North and South Carolina. About 10 per cent of the pulpwood is procured in the form of chips from sawmill waste.

Woodyard operations

A 50-ton crawler type crane is used to unload wood received by truck while another 50-ton crawler type crane unloads wood, received by rail, to two 80-ft. by 1,000-ft. storage piles. Wood is also unloaded from railroad cars directly into the 3-ft. wide, 1,000-ft. long flume by a self-propelled rake. Two 10,000 gpm vertical pumps circulate the water through the flume.

Logs are debarked in two 12-ft. dia., 67½-ft. long, M-bar, chain suspended, 3-section barking drums, each driven, through fluid couplings and parallel shaft reducers, by three 75 h.p. induction motors. The drums are equipped with air-operated vertical gates at the discharge end. Bark is conveyed through a swing hammer shredder and stored in a 14,000 cu. ft. capacity bin for use as fuel in the combination boiler.

Debarked logs are fed to two 110-in., 12-knife chippers equipped with blower housings to discharge chips into cyclones which supply a belt conveyor. The belt conveyor conveys the chips to the Rotex, Model No. 72 chip screens. The screens feature two screen surfaces, with approximately 100 sq. ft. of area in each, and are designed to handle 30 cords of chipped wood per hour. Their characteristic gyratory motion prevents upending of chips on the top scalping screen and also makes it possible to use a smaller-opening sawdust screen for efficient fine dirt removal. Oversized chips are rechipped in a 40-in., 6-knife rechipper. Accepted chips are stored in two chip silos of 200-cord capacity and Chemtile construction.

T. C. Bannister
Gen. Manager
Bowaters Carolina Corp.

Chipper knives are kept in good operating condition by a Model AK 150-in. long capacity, traveling wheel grinder equipped with air-operated clamps for holding the knives.

The silos are equipped with 17-ft. dia. rotary plate feeders, each capable of feeding 135 cords of chips per hour onto a belt conveyor which conveys them through a weightometer and motor propelled tripper to the digesters.

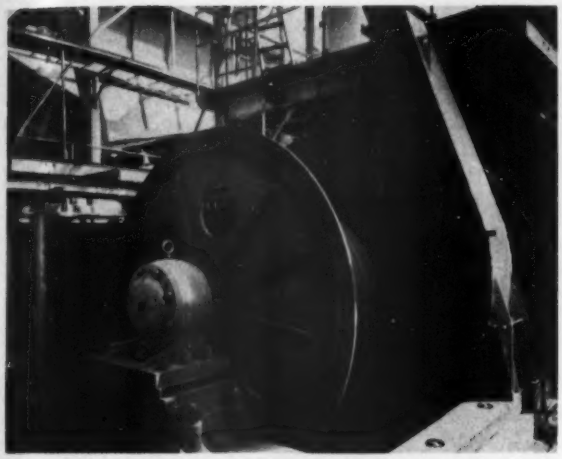
Purchased chips are handled through a separate system. These are received in a 58-ft. long and 18½-ft. wide pit and are then conveyed by chain and belt conveyors to a pneumatic conveying system which blows them to the cyclones and screens.

Digesters

The five digesters, 12 ft. dia. and 50 ft. high, are of 2-in. thick steel construction. They are equipped with electrically operated blow valves and discharge through individual blow lines into a 28-ft. dia. by 70-ft. high blow tank.

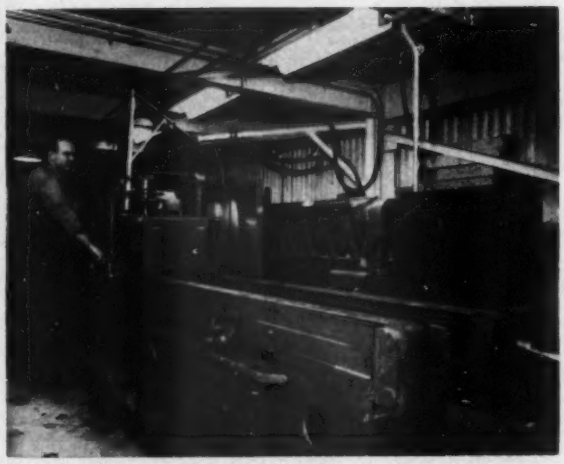
The blow steam passes through a special cyclone at the top of the blow-tank to an accumulator and the heat recovery system. The heat recovery system mounted above the accumulator tank consists of a direct contact type, 90-in. dia. condenser which has a capacity of heating 1,635 gpm at 160° F. The heat from the condenser is transmitted to the process water by way of a plate heat exchanger which has a capacity of raising the temperature of 409,000 lb. per hour of process water from 110°F. to 160°F.

Relief steam from the digesters passes through individual separators,

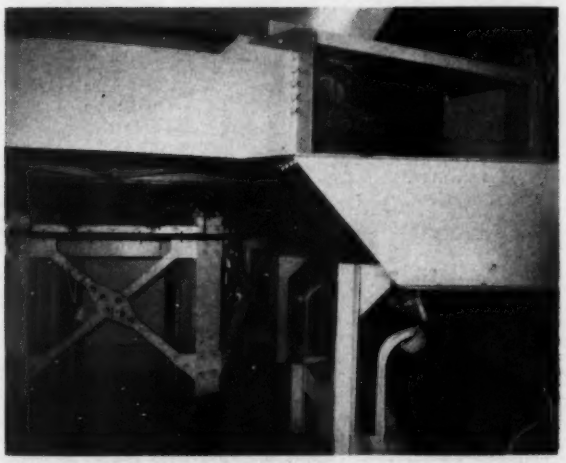


Murco 110-in., 12-knife chipper equipped with blower housings.

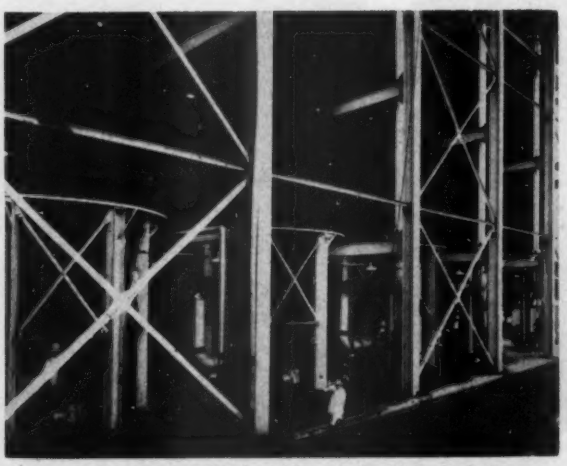
Orville Simpson Co. Rotex, Model 72, screens of 30 cords/hr. capacity.



Hanchett Mfg. Co. Model AK traveling wheel type knife-grinder.

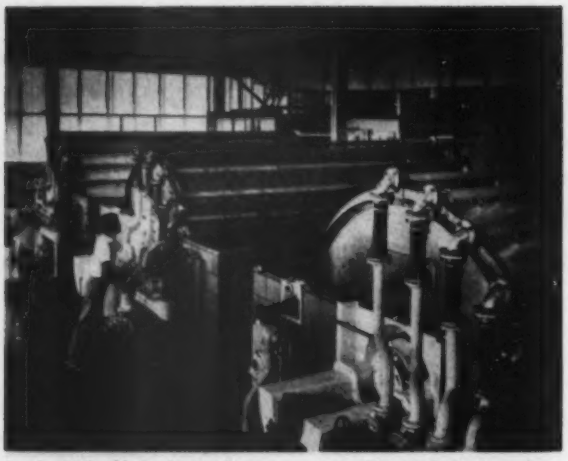


Link-Belt rotary plate feeders feed chips from the silos to a belt conveyor.

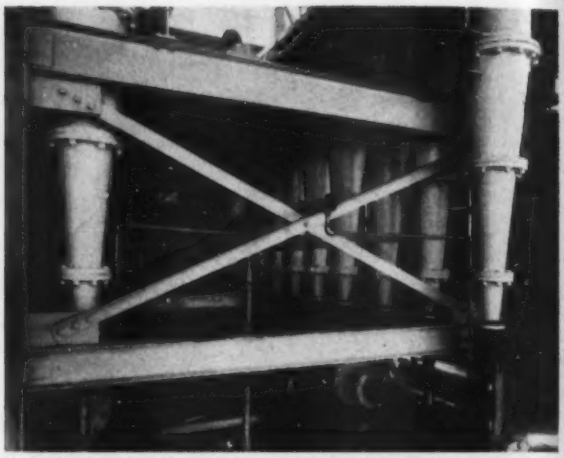


Chicago Bridge & Iron Works 12-ft. dia. by 50-ft. high digesters.

Dorr-Oliver 11½-ft. by 20-ft. cone valve type brown stock washer.

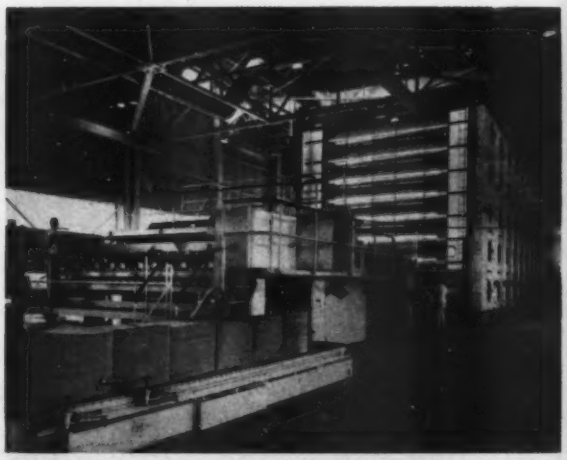


Sandy Hill 9½-ft. by 16-ft. vacuum-type bleached stock washers.

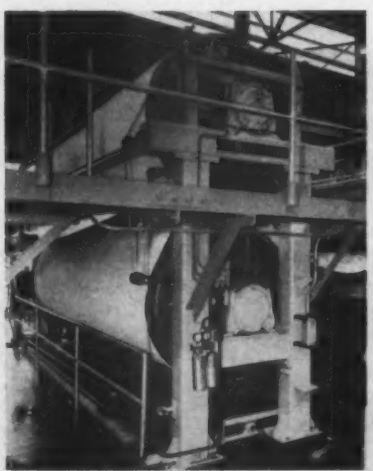


Bauer Bros. Centri-Cleaners are installed ahead of the stainless steel headbox.

Sandy Hill press section consists of two presses and a predryer.



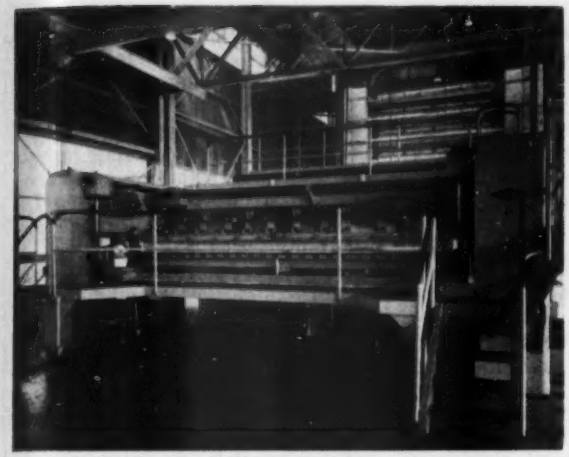
Dry end of American SF Products Flakt dryer of the airborne-web type.



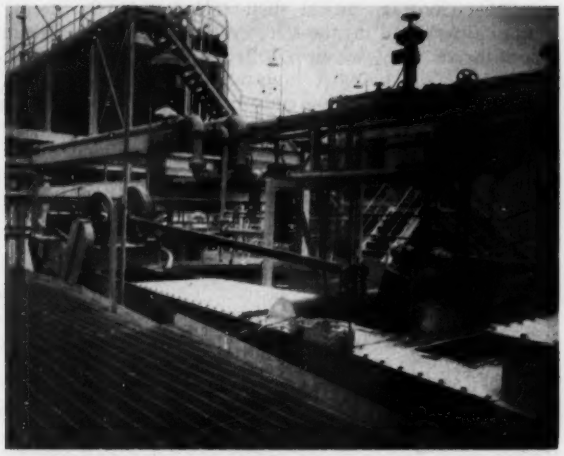
Sandy Hill predryer with 5-ft. dia. rolls.

Wet end of American SF Products Flakt dryer.

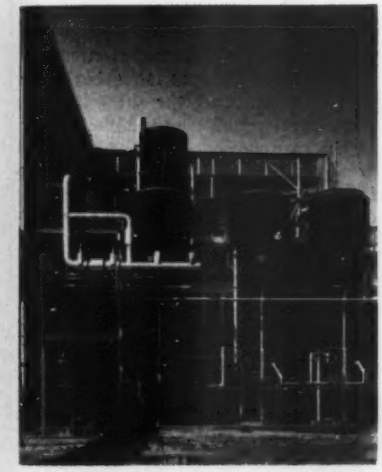
Washington Iron Works 800-ton capacity baling press.



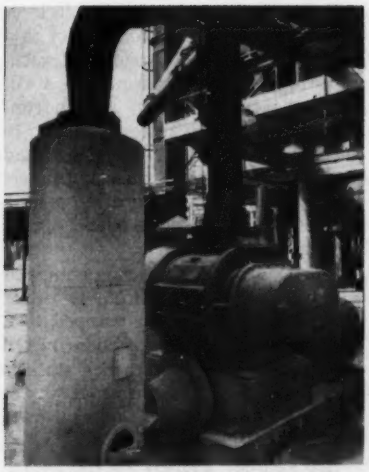
Lamb-Grays Harbor cutter-layboy with dual set slitters, fully automatic.



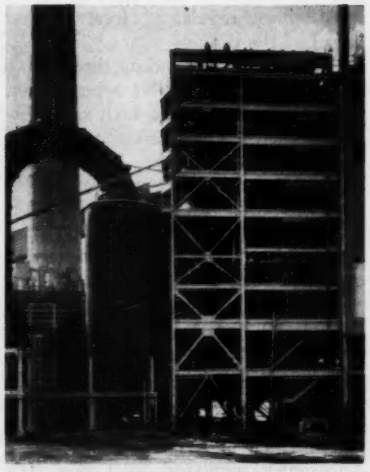
Dorr-Oliver No. 10 lime slaker is part of the continuous recausticizing system.



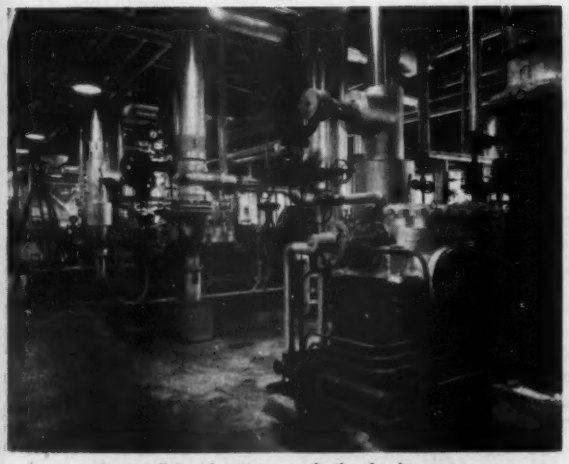
Goslin-Birmingham sextuple effect evaporators.



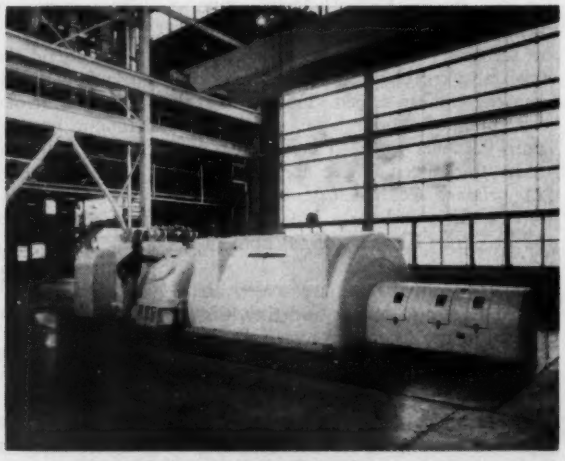
Fuller Co. Airveyor system handles salt cake.



Babcock & Wilcox 208,000 lb/hr steam capacity recovery boiler.



Ingersoll-Rand 1,200 gpm boiler feed pumps.



General Electric 12,500 KW turbine-generator.

a relief cyclone, a vertical shell and tube condenser and decantor for crude turpentine recovery, which is collected in two 10-ft. dia. by 34-ft. high tanks.

Digester instrumentation consists of five modern automatic control systems operated from the digester panel. These consist of (1) automatic liquor fill systems; (2) automatic steaming controllers; (3) automatic heat recovery controllers; (4) automatic relief flow controllers; and (5) turpentine recovery controllers.

The blow tank as well as all stock tanks and chests, liquor tanks and chemical tanks are equipped with Type 13FA d/p cell transmitters for liquid level control.

Pulp washing and screening

Stock from the blow tank is pumped through a specially designed trap and an electro-magnet to the Claflin refiners, its 3½ per cent consistency being controlled by a load sensing device on the blow tank agitator and a consistency regulator located just ahead of the refiners.

Stock is then washed on three 11½-ft. by 20-ft., cone valve type, brown stock washers equipped with shredder-repulpers, shredder conveyor, and mechanical foam breaker. The washed brown stock is then stored in a 150-ton, tile-lined high density storage tank equipped with dilution nozzles and agitator. The washers are further equipped with hoods and exhaust fans.

From the high density storage tank stock is pumped at 3½ per cent consistency, which is controlled by a pipe line consistency regulator, into an agitated surge and blending chest of tile construction.

From here it is pumped, through a consistency regulator, to a mix tank and then to a screening system consisting of two primary centrifugal screens and two secondary screens and a tertiary screen. Accepted stock from the primary screens discharges into two 9½-ft. by 12-ft. valveless type thickeners, while accepted stock from the secondary screens goes to a chest which also receives the accepted stock from the tertiary screen. This stock is then pumped through a series of Centri-Cleaners prior to being passed to the thickeners. There are six No. 623 primary Centri-Cleaners of 500 gpm capacity, and three No. 606 secondary Centri-Cleaners of 90 gpm capacity.

Rejects from the tertiary screen are refined in a disc refiner and then discharged to the secondary screen rejects chest.

Pulp bleaching

The screened stock is pumped at regulated consistency to the brushing jordans and a magnetic flow meter prior to entering the three-stage bleach system consisting of a chlorination stage, caustic extraction stage, and a hypochlorite stage.

The 17-ft. dia. by 90-ft. high, tile-lined, upflow chlorination tower is equipped with a chlorine mixer and a type CR circulation pump at the bottom and a rubber-covered scraper and a 360° launder ring at the top. The scraper, driven by a totally enclosed gear unit direct coupled to a motor, is used for scraping the pulp into the launder.

The chlorinated stock is washed on a 9½-ft. dia. by 16-ft., rubber-covered vacuum washer and then discharged via a screw conveyor through a double shaft steam mixer to the 16½-ft. dia. by 60-ft. high, tile-lined caustic extraction tower equipped with two Type CT circulation pumps and dilution nozzles at the bottom to keep the stock here at approximately 2½ per cent consistency.

From the caustic tower, stock is pumped at 1 per cent consistency to a 9½-ft by 16-ft, rubber-covered vacuum washer and discharged by a cut flight conveyor, through a high consistency double-shaft steam mixer, to the 18-ft. dia. by 16 ft. high, tile-lined hypochlorite tower. Both steam mixers are equipped with automatic opening and closing steam nozzles and are of split-casing design.

The hypochlorite tower is equipped with nozzles at the bottom to dilute the stock which is then pumped to a 9½-ft. dia. by 16-ft, rubber-covered vacuum washer. The bleached stock is discharged into a 75-ton capacity, 18-ft. dia. by 61-ft high, high density stock tower.

All vacuum washers in the bleach plant are equipped with patented automatically loaded self-aligning sealing valves to give constant uniform loading pressure. The washer vats are of Chemtile construction.

The control panel for the bleach plant includes (1) control for the 8-in. magnetic flow meter measuring stock flow to the bleach plant; (2) washer controls; (3) controls for magnetic flow meter measuring hypochlorite solution into the 3rd stage; (4) a Multi-Record Dynalog recorder which provides electrical, multiple measurements of caustic and hypo temperatures at the towers. The temperatures are sensed by Dynatherm resistance bulbs.

Pulp drying

Stock is pumped from the high density stock tower through a consistency regulator to a surge chest. Then through a consistency regulator and magnetic flow meter. An 8,100 gpm SLH fan pump pumps the diluted stock through 19 No. 623-4, 650 gpm primary, three No. 623, 500 gpm secondary and one No. 623, 500 gpm tertiary Centri-Cleaners to a stainless steel headbox on the 11½-ft. dia. 195-in. sheet former equipped with vacuum receiver. The sheet former features four press rolls with pressures varying from 25-200 lb. per linear inch. The sheet former vat is of Chemtile construction.

A rubber couch roll removes the sheet from the face of the forming cylinder and feeds it to the first press. A shredder conveyor is also installed here to repulp the sheet during threading operations.

The press section consists of two heavy-duty presses located on either side of two 5-ft. dia. predryer rolls. The presses, equipped with antifriction bearings and air cylinders for pneumatic lifting and loading, are designed to operate at pressures of 1,800 and 2,800 lbs. per linear inch respectively. The presses feature grooved press rolls and adjustable doctors and are designed for maximum removal of water. Water removal is further aided by (1) introducing the sheet into the press over specially adjustable rolls in such a manner as to prevent rewetting of the sheet with the removed water and (2) the adjustable water doctor design which removes water from the sheet to prevent rewetting.

After leaving the second press the sheet enters the dryer designed to convey the sheet through 17 horizontal passes by means of jets of heated air. This is the first dryer of its kind used in North America and the largest of the five Flakt dryers using the air-borne web system currently in operation.

The 104-ft. long, 27½-ft. wide and 27¼-ft. high pulp dryer, has a daily capacity of 500 tons of pulp dried from 45 per cent to 90 per cent BD. Its high drying efficiency is reflected by its low steam consumption which has been reported at 1.22 lb. of steam per lb. of water evaporated and its low power requirements amounting to 0.-014 KW per hour per lb. of water evaporated.

The dryer consists of 24 identical, 4-ft. long fan sections and two end sections. Each of the fan sections, arranged in a zig-zag fashion, has five circulation fans of axial flow type, mounted in vertical rows and delivering air to the air distributors. The air is distributed across the wdith of the machine for impingement on the top and bottom surfaces of the traveling sheet. The air is then exhausted to the opposite end of the section through the exhaust slots, sucked through a bank of heating coils to raise the air's temperature to about 320°F prior to

Principal equipment installed at Bowaters Catawba mill

Wood handling

Barking drums (2), 12-ft. dia. by 67-½ ft. long, M-bar, chain-suspended, three section type ..... Fibre-Making Processes Inc.
Chippers (2), Murco, 110-in., 12-knife, equipped with blower housings ..... D. J. Murray Mfg. Co.
Chip silos (2), Chemtile construction, 200 cord capacity ..... Chemical Linings Inc.
Chip screens, Rotex, Model 72, with two screen surfaces, 30 cords/hr capacity ..... Orville Simpson Co.
Grit collector and conveyors ..... Chain Belt Co.
Knife grinder, AK model, 150-in. long capacity, traveling-wheel type ..... Hanchett Mfg. Co.
Rechipper, Murco, 40-in., six-knife ..... D. J. Murray Mfg. Co.
Rotary plate feeders, 135 cord/hr. capacity, on chip silos ..... Link-Belt Co.
Traveling screens ..... Chain Belt Co.

Digesters

Blow tank, 28-ft. dia. by 70-ft. high, equipped with accumulator tank ..... Hammond Iron Works
Blow tank agitator ..... Black-Clawson Co.
Blow tank agitator load sensing device, for consistency control ..... Foxboro Co.
Blow valves, electrically-operated ..... Yarnall-Waring Co.
Condenser, direct contact type, 90-in. dia., 1,635 gpm of water heating capacity, in digester heat recovery system ..... Foster Wheeler Corp.
Digesters (5), 12-ft. dia., by 50-ft. high, of 2-in. steel construction ..... Chicago Bridge & Iron Works
Digester instrumentation, and panel ..... Foxboro Co.
Heat exchanger, plate-type, 409,000 lb./hr. capacity ..... DeLaval Separator Co.
Liquid level control, Type 13FA d/p cell transmitter on blow tank, stock tanks, etc. ..... Foxboro Co.
Trippers, 42 B.W. driven with 5-hp gearmotor .... Continental Gin Co.
Turpentine recovery system, including separators, relief cyclone, vertical shell and tube condenser, and decantor ..... Foster Wheeler Corp.

Pulp washing and screening

Brown stock washers (3), 11½-ft. by 20-ft., cone valve type, with shredder-repulpers, shredder conveyor, and foam breaker ..... Dorr-Oliver Inc.
Brown stock washing and screening control system ..... Foxboro Co.
Centri-Cleaners (9), 6 No. 623 of 500 gpm capacity, and 3 No. 606 of 90 gpm capacity ..... Bauer Bros. Co.
Centrifugal screens (5), two primaries, two secondaries, and one tertiary ..... Montague Machine Co.
Claflin refiners, Emerson ..... John W. Bolton & Sons Inc.
Consistency regulators ..... DeZurik Corp.
Disc refiner ..... Sprout-Waldron Co. Inc.
High density storage tank, 150 ton capacity, equipped with dilution nozzles and agitator, Chemtile construction ..... Chemical Linings Inc.
High-density storage tank agitator ..... Black-Clawson Co.
Pipeline consistency regulator ..... DeZurik Corp.
Stock pumps ..... Buffalo Pumps, Div. of Buffalo Forge Co.
Surge and blending chest, Chemtile construction ..... Chemical Linings Inc.
Thickeners (2), 9½-ft. by 12-ft., valveless type ..... Dorr-Oliver Inc.
Washer hoods and exhaust fans ..... J. O. Ross Engineering Co.

Pulp bleaching

Bleach system, 3-stage, Kamyr type .... Sandy Hill Iron & Brass Works
Bleach plant control system ..... Foxboro Co.
Bleached stock washers (3), 9½-ft. dia. by 16-ft. face, rubber-covered, vacuum type .. Sandy Hill Iron & Brass Works
Caustic extraction tower, tile-lined, 16½-ft. dia., 60-ft. high, equipped with two Type CT circulation pumps and dilution nozzles ..... Sandy Hill Iron & Brass Works
Chlorination tower, upflow type, 90-ft. high, 17-ft. dia., equipped with chlorine mixer, circulation pump, rubber-covered scraper, and launder ring ..... Sandy Hill Iron & Brass Works
Hypochlorite tower, 18-ft. dia. by 60-ft. high, tile-lined, equipped with dilution nozzles ..... Sandy Hill Iron & Brass Works
Jordans (2), Miami No. 6 ..... Black-Clawson Co.
Magnetic flow meter ..... Foxboro Co.
Steam mixers, double-shaft, split-casing design ..... Sandy Hill Iron & Brass Works
Washer vats, Chemtile construction ..... Chemical Linings Inc.

Pulp drying

Centri-Cleaners (23), 19 No. 623-4 primaries, 3 No. 623 secondaries, and 1 No. 623 tertiary ..... Bauer Bros. Co.
Consistency regulators ..... DeZurik Corp.
Drives, motors, and 200-KW motor generator ..... Reliance Electric & Engineering Co.
Fan pump, 8,100-gpm SLH type ..... Buffalo Pumps Inc.
Flakt dryer, airborne-web type, 500 tons/day capacity; equipped with 120 circulation fans, heating coils, 16 turning rolls, etc. ..... American SF Products Inc.
Magnetic flow meter ..... Foxboro Co.
Predryer, equipped with two 5-ft. dia. rolls ..... Sandy Hill Iron & Brass Works
Presses (2), equipped with antifriction bearings, air cylinders, grooved press rolls and adjustable doctors; designed to operate at 1,800 and 2,800 lb. per linear inch ..... Sandy Hill Iron & Brass Works
Sheet former, 11½-ft. dia., 195-in. face, equipped with vacuum receiver and four press rolls ..... Dorr-Oliver Inc.
Vat on sheet former, Chemtile construction .... Chemical Linings Inc.

Finishing and shipping

Baling press, 800-ton capacity, equipped with Oilgear surge valves ..... Washington Iron Works
Baling press pump, Type "DXP-10025", two-way variable speed, 71.8 gpm capacity at operating pressure of 2,500 psi ..... Oilgear Co.
Conveying system serving baling press, Airfloat type, consisting of press feed unit, press platen, and press discharge unit; fully automatic ..... Lamb-Grays Harbor Co.
Cutter-layboy, equipped with dual set slitters; fully automatic layboy ..... Lamb-Grays Harbor Co.
Lowerator-stacker ..... Lamb-Grays Harbor Co.

Chemical recovery

Airveyor systems, 10 ton/hr. capacities, one for salt cake handling and one for lime stone handling ..... Fuller Co.
Black liquor pumps, 140-700 gpm capacity, of complete Worthite construction or with Worthite shafts and impellers ..... Worthington Corp.
Electrostatic precipitator, wet bottom, horizontal, double chamber, 40-lane type ..... Koppers Co. Inc.
Evaporators, sextuple effect, equipped with 2-in. dia. stainless steel tubes in first effect and carbon steel tubes in other effects; features novel feed arrangement and 4-pass stainless steel tube condenser .... Goslin-Birmingham Mfg. Co. Inc.
Pumps, green liquor, black liquor fuel ..... Worthington Corp.
Recausticizing system, continuous ..... Dorr-Oliver Inc.
Recausticizer control system ..... Foxboro Co.
Recovery boiler, equipped with cyclone evaporator; 208,000 lb/hr. steam generating capacity, cyclone evaporator equipped with spray nozzles and Worthington 2,200 gpm black liquor recirculating pumps ..... Babcock & Wilcox Co.
Recovery boiler control system ..... Bailey Meter Co.

Power and steam generation

Boiler, combination bark-oil-and-gas burning; 300,000 lb/hr. steam generating capacity; with water-cooled furnace, Rotograte spreader stoker, horizontal continuous tube economizer and dust collector ..... Babcock & Wilcox Co.
Boiler control system, fully automatic ..... Bailey Meter Co.

Principal equipment, continued

Boiler feed pumps (3), 6HMTA type, 1,200 gpm each, two driven by 1000-hp Terry steam turbines, and one by a 1000-hp electric motor ..... Ingersoll-Rand Co.
Deaerating heater, 900,000 lb/hr. spray tray heater, operating at 65 psi pressure; equipped with stainless steel spray valves, tray banks, and hood ..... Graver Water Conditioning Co.
Turbine-generator, 12,500 KW, automatic 150 psi extraction ..... General Electric Co.
Turbine-generator condenser, 9,000-sq.-ft. horizontal, two-pass, radial flow, deaerating type surface condenser ..... Westinghouse Electric Co.
Turbine-generator oil conditioner, dry-type, equipped with precipitation, filtering and storage compartments ..... Bowser Inc.

General

Air compressors ..... Pennsylvania Pump & Compressor Co.
Backwash pump, for filtration plant ..... Allis-Chalmers Mfg. Co.
Chemical pumps (6), single suction ..... Buffalo Pumps Inc.
Cranes (5), one 25-ton capacity; three 30-ton capacity, and one 5-ton capacity .... Manning, Maxwell & Moore Co.
Fuel oil heaters ..... Brown Fintube Co.
Fuel oil pumps ..... Warren Pumps Inc.
Fuel oil temperature controllers ..... Taylor Instrument Co.
Motors, special purpose ..... Electric Machinery & Mfg. Co.
Sight flow indicators ..... Fischer & Porter Co.
Soap pumps ..... Viking Pump Co.
Steel tanks ..... Hammond Iron Works
Stock pumps (46), paper stock pumps, up to 11,000 gpm capacities ..... Buffalo Pumps Inc.
Vacuum pumps ..... Nash Engineering Co.
Water and white water pumps (19), double suction ..... Buffalo Pumps Inc.

introducing it into the next section. The total air quantity circulated amounts to 2.5 million cfm and the power consumption is approximately 950 hp.

There are 8 turning rolls at each end of the dryer. These are driven through chain transmissions by variable speed dc motors. The speed of these rolls is controlled by a dancer roll, located ahead of the dryer, the weight of which can be adjusted to obtain a suitable tension on the pulp sheet.

A nip roll, located at the dryer inlet, lifts the pulp sheet from the second press during threading.

Finishing and shipping

After passing through the pulp dryer, dry pulp enters a cutter equipped with a dual set of slitters which cut the sheet into 26- by 32-in. sheets and delivers these to a continuous automatic layboy. The layboy piles the sheets into stacks weighing approximately 450 lb. These stacks are automatically discharged, via a scale unit, to an 800-ton capacity baling press.

The baling press is served by a press Airfloat conveyor section which includes a press feed unit, a press platen, and a press discharge unit. The operation of all these units is fully automatic.

The bales are then wrapped, tied and conveyed to a lowerator-stacker where they are stacked and lowered to the floor below. The bales are then handled by fork trucks to shipping and warehouse.

The baling press features a Type "DXP-10025" two-way variable delivery pump capable of delivering 71.8 gpm at an operating pressure of 2500 psi. The pump is equipped with a remote operating control and a pressure unloading control.

Chemical recovery

The six-body, sextuple effect evaporators, installed in a U-shaped arrangement, are designed to concentrate 428,000 lb. of black liquor from 14 per cent to 50 per cent total solids content, when supplied with 56,000 lb. per hour of 45 psi steam. The high efficiency of this evaporator system is exemplified by the evaporation of 5.52 lb. of water per pound of steam, made possible through a new and novel feed arrangement into the evaporators. The first effect evaporator is equipped with 2-in. dia. stainless steel tubes, while the other five evaporators have welded seam carbon steel tubes. A four-pass condenser features 1-in. dia. stainless steel tubes. There are six black liquor pumps and three condensate pumps. The pumps, ranging in capacity from 140 to 700 gpm, are either of complete Worthite construction or have Worthite shafts and impellers.

Black liquor is burned in a chemical recovery boiler equipped with a cyclone evaporator. The unit is designed to burn 1,350,000 lb. of black liquor per day and generate 208,000 lb. per hour of 805 psi, 825°F steam. Boiler passages are cleaned by automatic sequential, steam blowing soot blowers, supplemented by steam hand lances where required.

Black liquor is recirculated by two 2,200 gpm black liquor pumps to the spray nozzles at the top of the cyclone evaporator. The 300°F gas from the cyclone evaporator is handled by a double inlet induced draft fan with a capacity of 193,000 cfm of gas when driven through a hydraulic coupling by a 600 hp induction motor.

A forced draft fan driven by a 250 hp motor delivers 100,000 cfm of air at 13-in. water pressure. The air is heated to a temperature of 300°F by a 50 psi steam air heater.

— We regret that the term Duotrol, a Black-Clawson trade name for Jordan-controls, was misspelled on two occasions in the August issue of The Paper Industry.

An Airveyor system conveys salt cake at the rate of 10 tons per hour from the railroad cars to a 1,000 ton capacity elevated steel storage tank and then to a silo located above a mixing tank at the recovery boiler. All salt cake delivered to the recovery furnace is passed through a swing hammer pulverizer to reduce any lumps to ⅛-in. size.

The smelt from the recovery furnace discharges through two smelt spouts into a 22-ft. dia. dissolving tank.

The recovery boiler control includes (1) automatic control of black liquor burner nozzle pressure; (2) automatic control of total air for black liquor firing; (3) automatic control of total air-primary air ratio, tertiary air, and furnace draft; (4) three-element feed water control and two-element steam temperature control; and (5) level controls of salt cake mix, cyclone sump and smelt dissolving tanks.

Salt cake is collected from the recovery boiler fumes by a wet bottom, electrostatic precipitator located between the induced draft fan and the stack. The precipitator is a horizontal double chamber, 40-lane, two-field, pressurized type.

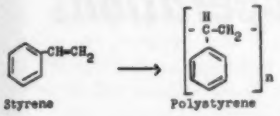
The continuous recausticizing system consists of (1) a No. 10 lime slaker; (2) three 12-ft. and one 30-ft. dia. white liquor clarifiers, including tanks, trays and mechanisms; (3) a 30-ft. multiple-tray lime mud washer; (4) a 20-ft. lime mud storage agitator with tank and mechanism; (5) a 6-ft by 8-ft. lime mud filter; (6) a 35-ft. green liquor clarifier, including tank and mechanism; (7) a 24-ft. dregs washer and an 8-ft. dregs mixer with tanks and mechanisms; (8) a No. 10 Hypo lime slaker; (9) 17 pumps, including five No. 6W Duplex suction pumps, three No. 2 VM suction pumps, and nine Worthite centrifugal pumps; (10) two 20-ft. lime storage bins; and (11) lime handling equip-

(Continued on page 641)

Adhesives in the paper industry

Part VII (Continued): Styrene resins and synthetic elastomers

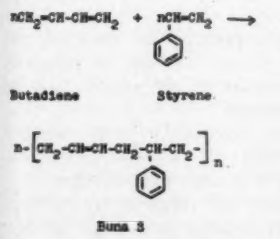
THE STYRENE RESINS are closely related to the vinyl resins, since exactly the same type of chemistry is involved in the polymerization reaction. The equation for the formation of polystyrene from styrene is indicated below:



Styrene — Polystyrene

Several variations are possible resulting from the inclusion in the polymerization reaction of monomers such as divinylbenzene which leads to cross-linking or α-methyl styrene which improves solubility.

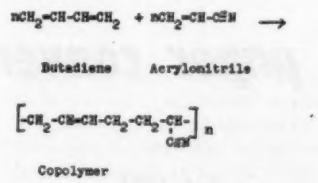
Polystyrene is a thermoplastic material which may be applied from solvent or from water dispersion. Polystyrene has excellent electrical insulation properties which make it of value in the electrical industry. The shoe industry has also been able to make use of polystyrene adhesives. Styrene may, of course, be copolymerized with a wide variety of materials, chief of which is butadiene, to obtain Buna S, a widely used synthetic rubber. The equation which demonstrates this follows:



Butadiene — Styrene

Buna S

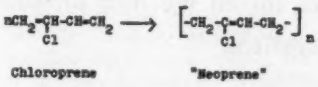
The synthetic elastomers are available in the form of latex. The most prominent is the styrene-butadiene type which is widely used as an adhesive in clay coating in coating operations. Styrene-butadiene latices are also widely used as the base adhesive in the water soluble household wall paints. These latices are the result of the copolymerization of styrene with butadiene according to the equation listed below:



Butadiene — Acrylonitrile

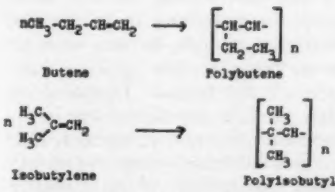
Copolymer

One of the earliest synthetic rubbers was Neoprene, which results from the polymerization of chlorobutadiene or chloroprene. This can be demonstrated by the following equation.



Chloroprene — "Neoprene"

Still a different type of elastomer results from the polymerization of butene or isobutylene to give polybutylene or polyisobutylene, respectively. These reactions are indicated as follows:



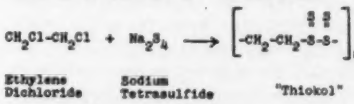
Butene — Polybutene

Isobutylene — Polyisobutylene

Recent technology makes possible the polymerization of isoprene to yield a "synthetic natural rubber". Natural rubber which has been chlorinated or cyclized also provides the basis for rubber-type adhesives.

The so-called "Thiokol" rubbers which are entirely different than any of the synthetic elastomers thus far described are of interest because of their excellent resistance to aromatic fuels. Thus, they are used as adhesives where good chemical resistance is necessary.

The "Thiokols" result from the condensation of ethylene dichloride with sodium polysulfide according to the following equation.



Ethylene Dichloride — Sodium Tetrasulfide — "Thiokol"

Application of synthetic rubber adhesives

The use of synthetic rubber adhesives follows the pattern already discussed for natural rubber adhesives. The pressure sensitive tapes, household adhesives and adhesives for foil, paper, leather, metal, rubbers and plastic films all are based on elastomeric resins.

They provide tough and waterproof paper-to-paper bonds in such applications as heading and wrapping of paper rolls. They are used for self-sealing of paperboard and corrugated cartons, display mounts, bags, envelopes and wrappers.

They are also used on polyethylene-coated or wax-coated paper and paperboard stocks in duplex or multiwall bag manufacture, folding carton manufacture, and other converting operations involving the sealing of coated surfaces with uncoated surfaces.

Synthetic rubber adhesives in paper coatings

Undoubtedly one of the widest applications of synthetic rubber latices, and especially styrene-butadiene latices, is in the field of paper coating. Here, they function as pigment binders and constitute from 25 to 60 per cent of the total adhesive in the coating formulation. The balance of the adhesive systems usually is one of the

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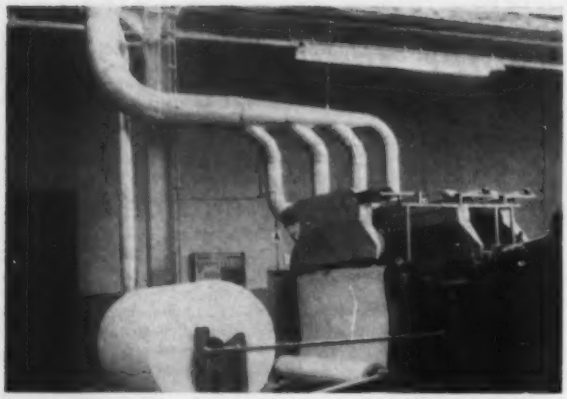
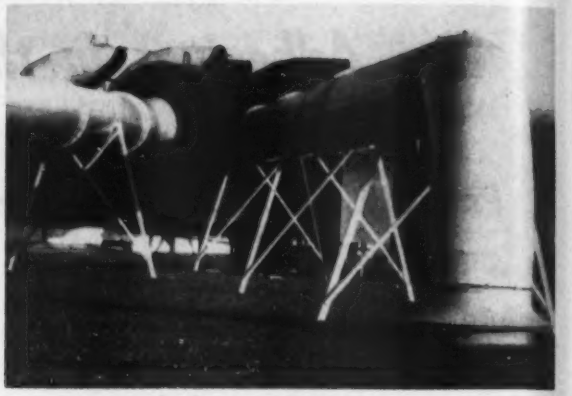


Slot-type hoods over a cant-winder installation.



Main ductwork and fans outside the operating area.

Dust removal in paper converting operations

R. E. FUTER

Engineers Associated Inc.*

The development of high-velocity, slot-type, retractable hoods have solved the dust problem in Crown-Zellerbach's converting operations.

RECENT STUDIES, made by Engineers Associated Inc., in the movement of solid particles by air, have led to an important new method of removing paper dust generated in paper converting operations. These studies included such design criteria as (1) terminal velocity (the air stream velocity minimal to transporting a given material), (2) capture velocities, (3) air-to-solids ratios, and (4) the methods of deposition of the airborne particles.

As an outgrowth of this work, industrial engineers at Crown Zellerbach Corp., concerned with the problem of dust laden air in their converting operations, presented the problem to Engineers Associated for a practical working solution.

The problem common to virtually all converting operations is aggravated in the department of tissue perforating and rewinding immediately prior to packaging. It requires no team of experts to observe that dust conditions are damaging to personnel, both physically and psychologically, and consequently influence adversely morale, turnover, productivity and compensation. The dust settling out and building up, on everything from electrical switch gear to light fixtures or space heaters, being readily ignitable, also presents a fire hazard. Thousands of dollars are lost due to damage by infiltration of dust into equipment. Electrical and electronic equipment is particularly susceptible to such infiltration. Lastly, the direct out-of-pocket cost of crews working to maintain some degree of house cleaning is a big expense which can be tremendously reduced through automated removal of the dust and small waste.

Earlier attempts to deal with this problem have had disadvantages and limitations. Overall hooding of rewinders and other items of equipment is both costly and impractical. The interferences created from the operator-process standpoint affect the productivity adversely. A modified hooding over the machines, leaving access room for rethreading the paper, does not provide the answer for several reasons:

1. Interference with monorail operation.
2. High horsepower requirements by reason of the tremendous quantities of air which must be removed.
3. Heat losses in cold weather periods.
4. High capital expenditures.
5. Unless air volumes are tremendous, a large percentage of dust never does become entrained in the outgoing air stream.

The new system

Each of the foregoing objections was either partly or entirely eliminated in the process developed and installed subsequently in two of the large con-

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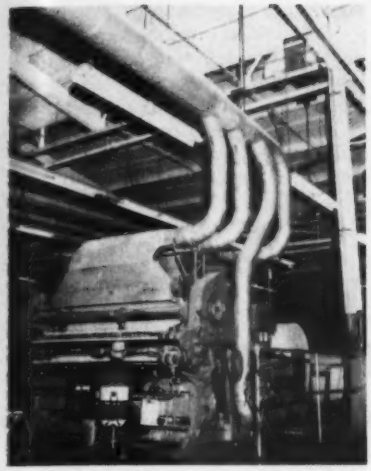
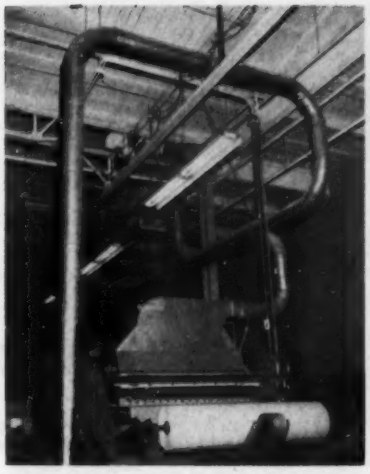
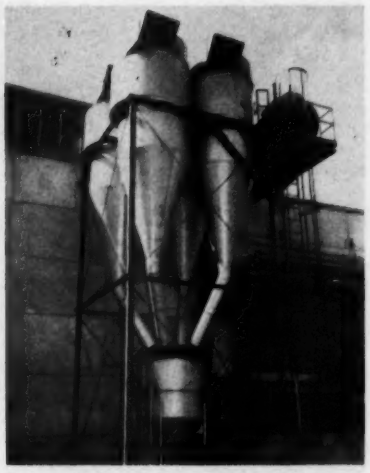


Ductwork and risers to pickup points, retractable hood.



Ductwork and retractable fish-tail hood over paper web.



Dust collectors feature wet scrubbing and automatic waste disposal.

verting operations of Crown Zellerbach at Antioch and Los Angeles, Calif. It became apparent that here, indeed, the application of high velocity, slot-type hoods could, if properly applied, be an ideal solution. In 1957, pilot model studies were made with material and jury-rigged equipment at the former San Leandro facilities of Crown Zellerbach Corp., followed by shop tests of various hood designs, to result in a slit-type hood which could produce an even inlet air velocity across the entire 90-in. length (a maximum of 90-in. wide rolls were being processed). The influence of inlet slot width and face effects were altered and measured for their influence on capture velocity conditions. Out of these experiments came the fish tail interior baffled hood and plenum chamber arrangement (see illustrations). With this development it was possible to sweep the traveling web free of the dust which was either lying on the surface of the web or was entrained in the fraction of an inch of air film traveling along with the moving web.

Designers then went to work on the principle of retracting this type of hood, mounted over and adjacent to the rewinders, so that the machines could be serviced as readily as prior to the installation of the hoods. As designed, these hoods now swing aside by pneumatic action through controls located at the operator's station. Each, or all, of the slot hoods may thus be retracted at the touch of a switch.

Proper location of these hoods on tissue rewinders was determined by further field studies — to date confined to Hudson Sharp and Paper Converting machines. Further study was made of their successful application to other items of equipment, such as towel interfolders. The uniqueness of these slot hoods and their application have led to patent claims for them.

Placement of the hoods was of next concern. The problem here was to obtain sufficient capture velocity without increasing air demands (and horsepower and heat loss) and, at the same time, without "inhaling" the web of tissue itself. Actual tests have shown that it is easy to draw the web into the exhaust hood during a momentary slack of the web if the hood is improperly placed. In addition to locating retractable hoods above the machines to sweep the top side of the web, underside hoods were also necessary. These are normally not retractable, but serve to pick up the dust generated both within the machine and on the underside of the paper.

The duct work system, together with the power units — exhaust blowers — are of conventional design. They are, of course, sized properly to maintain constant velocities and balances throughout, and for an optimum between cost and proper performance. Considerations were given here mainly to the *pros* and *cons* of a single exhaust system (a single blower versus a separate exhauster for each machine). The latter condition was not considered justifiable, and conversely, a single blower was deemed too inflexible to satisfy service conditions at approximately ten different machine locations. It was therefore decided to use three separate exhaust systems, each serving a certain group of machines. In the more recent installation, the two-unit system appeared most advantageous. It is interesting here to note that comparative studies of cost of operation compared with canopy-over-machine type hoods will result in savings of power for motors, heat exhausted (based on California conditions), and allowances for maintenance and operation of the system, amounting to approximately $10,000, without including amortization savings by reason of a lower capital investment cost.

Methods of air-dust separation

Methods of separation of this very fine, light dust from the air stream were investigated quite thoroughly. Particle size and nature eliminated the use of conventional cyclones. Even batteries of high efficiency type cyclones with rotary lock problems did not appear suitable from the cost or operational standpoint. It is observed that quite often long, stringy and fairly thick waste can intermittently be introduced into the system, which can foul mechanisms such as rotary locks or flap gates. As developed and now in operation at both these installations, the collectors consist of high velocity centrifugal separators combined with wet spray impingement into a water chamber which at the same time provides an air lock without moving parts. Agitation by means of jets breaks the larger solid masses down and disperses them so they may settle out in the underlying sludge tank. It has been demonstrated conclusively that the centrifugal separators will not function without the water lock principle, and that this does insure that

(Continued on page 641)

Microscopic examination of repellent-coated seeds.

Research — primary concern in Buckeye's forestry management

BRUCE H. BRAMMER

BUCKEYE CELLULOSE CORPORATION has been undertaking a giant reforestation program since 1952, when it took over the management of its newly acquired 600,000 acres of forest land in Northern Florida. This program was intensified when Buckeye acquired 200,000 additional forest acres in 1956.

From the beginning of this program, many existing conditions were present on this large area of land. One condition was the low tree stocking, due to unregulated cutting of many years by previous owners. Vast areas of poorly drained land confronted Buckeye with another major problem. Also, the lack of adequate fire control had killed good pine and encouraged worthless brush.

Strong emphasis on research

Buckeye, which emphasizes research throughout its organization, has set up a Forest Research Center near its Foley, Florida, pulp mills as a core for its forest operations.

The Center has a combined office and laboratory building, greenhouse, nursery beds and suitable lands for experimental plantings.

Research is conducted in tree improvement by genetic selection. Research foresters work closely with chemists of Buckeye Technical Division at Memphis to develop trees with wood characteristics especially suitable for dissolving pulp. Tree selections are made on the basis of these desirable wood qualities as well as for rapid growth.

The laboratory, greenhouse and field tests are involved in other phases of the research program. Hard-to-kill brush that must be removed from planting sites is put through a series of tests by applications of different herbicides in the field. Stem tissue from these plants is then analyzed in the laboratory to determine the translocation of the chemical through the stem. Other plants are grown in the greenhouse and subjected to controlled tests.

Many field problems must be solved by the forestry research group before they become operational. Site preparation methods are worked out; direct seeding requirements are formulated; and nursery practices are developed by the group.

Woods produced and consumed

Slash pine, with its satisfactory pulping qualities and fast growth rate in this area, has been found the most desirable of the Southern pines for manufacture of dissolving and kraft pulps.

Although Buckeye's forest management is based on the production of pine and its Foley mill is basically a pine wood operation, Buckeye's interest turned to hardwoods when it was found that they could be used to pro-

W. D. Smith
Woodlands Manager

D. D. Stevenson
Chief Forester

duce pulps with different characteristics than pine pulps.

At present, most wood used at the Foley mill is secured from sources other than the company's own forests. To meet the needed requirements, 70 per cent of the pulpwood is purchased from private lands; 10 per cent comes in the form of chips from saw mills and 20 per cent comes from the Buckeye lands.

Site preparation

Mass production methods are being applied in the woods operations. A program designed to establish 200,000 acres of pine plantations on prepared sites within 20 years is underway.

Natural regeneration will be relied on for some portions of the land. Slash pine will be planted where natural regeneration is uncertain—such as poorly stocked, cut-over areas or the relatively dry sites. On sites where conditions are not suitable for machine planting, the direct seeding method is used.

Through experimental plantings it was found that slash pine survived better and grew more rapidly on cleared rather than uncleared sites. Here, Buckeye was faced with the problem of clearing native vegetation such as palmetto, gallberry, turkey, bluejack, runner oak and wire grass. This vegetation siphoned most of the available moisture from the sandy coastal plain soils, creating a drought condition for newly planted pines. Before Buckeye's purchase, this condition received little attention because it was not considered economical to invest in land clearing for forest plantations.

Comparisons were made between the growth of pine plantations on old fields and on wild sites in Florida. On a 30-year rotation, the data showed that 25 per cent more wood could be grown if the land were cleared. It was evident that there was good economic justification for a large scale site preparation program to obtain more rapid growth as well as better survival.

Buckeye began experimenting with methods of partial clearing of planting sites. Fire plows pulled in front of the planting machines increased survival but removed valuable organic material from the ground surface and left trenches which flooded the pine seedlings in wet weather. Drum choppers only retarded the ground vegetation unless areas were reworked several times. Undercutters, heavy knife blades drawn underground, killed palmetto but did not eliminate wire grass. Light disk harrows left many patches of palmetto and ground oak untouched. None of the equipment experimented with up to this point could clear dense scrub oak stands. Poisoning of the undesirable scrub oak with herbicides by hand application was considered feasible but only where the number of stems per acre was low.

D-8 tractors drag 270-ft. of heavy anchor chain.

Seedling harvester is also used to spread pine straw over the freshly planted beds.

To get 11,000 acres of scrub oak and cut-over flatwoods cleared every year (the schedule for the next five years), a three-phase clearing operation of scrub oak and a single-phase operation for the flatwoods was organized.

The first phase of this operation consists of dragging a 270-foot, heavy anchor chain between two D-8 tractors traveling 100 feet apart. An average of fourteen acres an hour can be pulled over by this method. In the second phase, the same tractors root-rake the oak into windrows approximately 200 feet apart. These windrows are not burned but are allowed to rot down to serve as fire breaks: they occupy about 10 per cent of the total area. In the final phase of the project, the tractors disk the cleared site with heavy Rome 24 disk harrows. The entire operation takes 1.1 hour of operating tractor time per acre.

No areas smaller than 100 acres are prepared with heavy equipment.

If small cut-over areas in a patchwork of locations were treated, the turning around time for the equipment per area and the travel time from one location to another would be too costly. The forest management system of area control which Buckeye has adopted lends itself to the preparation and planting of large blocks. With 1000 acres as the average size of management blocks, pine planting sites will average 500 acres although cut up somewhat by stream bottoms and cypress ponds.

Planting

Buckeye was one of the first supporters of a forest genetics program at the University of Florida to improve the quality of pine plantations by genetic selection.

A 30-acre seed orchard was established near the Buckeye nursery and planted with grafted stock from superior trees. In a few years the seed from these trees will supply the nursery. It is expected that at least a 25 per cent improvement in the rate of growth in the plantations will result from this tree improvement program. The Buckeye tree nursery grew 10,000,000 slash pine seedlings for the 1959-60 operations.

Planting operations got underway in October of this year and will continue until March of 1960.

Buckeye secured the first Tygart self-propelled tree seedling harvester on the market for its nursery operations. This Harvester consists of a steel frame mounted on four rubber-tired wheels. The rear wheels are power driven. Four bucket seats are suspended from the frame where operators sits directly above the nursery beds. As the pine seedlings are pulled from the beds, they are placed on an endless rubber belt which moves toward the rear. At the rear of the machine, two additional workers receive these seedlings on a platform and pack them with moist sawdust into wooden tote boxes. A crew of six—four pullers and two packers—can pull and pack 120,000 seedlings per day. It is estimated that the use of this machine saves the work of six additional men. Very little culling of seedlings is necessary since uniform-sized plants are grown.

The tote boxes, which hold 1500 seedlings, are then capped with sphagnum moss, watered and hauled to the planting site. They may also be stored in the shade at the nursery. The boxes are loaded each day and empties returned to the nursery. The filled boxes are set into frames on the planting machines, with each machine carrying about 3000 seedlings.

During the 1958-59 season, Buckeye operated 15 planting units and had one other unit under contract. About 7,600,000 seedlings were planted. During the last winter's operation the planting units averaged 6000 seedlings per 9-hour day.

Harvesting policies

To build up a system of sustained yield management for Buckeye lands, the forest property has been divided into management blocks averaging about 1000 acres in size. The timber on a certain number of these blocks is clear cut and the area planted each year. The total pine acreage will be treated in this way over a 30-year rotation. By the end of the first rotation, the forest will be supplying a large part of the mill requirements on a continuous production basis.

Harvesting of pulpwood on company lands is done under contract. The company is now entering into contracts with loggers who are equipped for long log operations. Truck trailers bring long logs into the mill where slasher saws cut them into the lengths needed for drum debarking. The company has recently expanded its woodyard which can now hold a 12-day supply of wood.

Swampland Conversion

The conversion of some 90,000 acres of non-productive swampland into pine stands has recently been undertaken by Buckeye. First, roads were built through the area on a grid to serve for access and for fire control breaks. Then canals were made as the drag lines scooped out the soil for the road beds. About 70 miles of roads and canals have been constructed so far.

The next step required eradication of brush on the area. Research in the use of herbicides applied by aircraft is being carried on and the results are promising. Buckeye foresters believe that controlled burning of the brush, followed by herbicide applications, will open up the areas sufficiently for a pine reforestation project.

When the land is prepared for planting, pine seeds are sown over the area by plane. One pound of seed is used per acre. The seed is treated with repellants to discourage mice, birds and insects.

Fire control

When Buckeye first took over the management of its forest properties, forest fires were a constant threat and a series of dry years aggravated the situation.

The fire protection organization now includes a company radio network with its own dispatcher. Key fire control equipment is tied in by radio to the State fire tower system. Fire crews are supplied with D-6 or equivalent tractors, radio-equipped, pulling Mathis fire plows and mounted on transports. Auxiliary equipment consists of power wagons carrying water tanks and necessary small tools. Two Piper Cub planes make regular patrols and direct fire crews by radio into fire locations. Buckeye is pushing road construction to bring about complete coverage of the property.

Continuous forest inventory

A timber inventory was completed by the company in 1954. A re-inventory will be made every 10 years. A Cessna plane is equipped with an aerial camera for photographing portions of the forest when requiring special inventories or where logging operations are in progress. Succeeding inventories will be based on the interpretations of aerial photographs.

Sample plots for growth and yield determinations are being established on 150,000 acres of hardwood timber under the so-called "continuous forest inventory" method.

Employment and training

Buckeye employs 33 supervisory and 69 hourly forestry workers on a full time basis. Approximately 40 extra hourly paid workers are employed during the heavy planting season. This figure does not include contract workers not paid by the company.

A highly successful "personalized" training program is worked up for each new member of management at Buckeye. First, the new employee is given a general orientation and complete historical background of the company. Next he has a complete organization breakdown where he visits all departments. He is introduced to all people in the management group. His next two weeks are spent with area foresters studying a different phase of the department each day. He also attends a monthly program to study case problems. Each year a full week's foremanship course is held for new members of management. This course covers basic information concerning the entire company.

The strength of Buckeye's training program lies in the fact that each new employee is rated on his strengths and weaknesses. From this rating he receives concentrated training in his weak areas and less training in those areas in which he rates strong. This saves training time and makes the employee feel that he is not completely green on his new job.

Symposia of the Division of Cellulose Chemistry of the American Chemical Society

LOUIS E. WISE
The Institute of Paper Chemistry
Appleton, Wisconsin

Part II — Heterogeneous papers and symposium on chromatographic analysis

THE FIRST of a series of heterogeneous cellulose papers, under the chairmanship of Professor Herman Mark, was that of Marie Easterwood and W. A. Mueller of the Buckeye Cellulose Corp., on **Factors Affecting Viscose Ripening.** At 15°C., ripening was studied from the standpoint of dexanthation rates and salt index (S.i.). For sulfate pulps, the dexanthation rates were constant, but apparently sulfite pulps ripened somewhat more rapidly. The rates were unaffected, over narrow ranges, by changes in alkalinity and were only slightly affected by the cellulose and sulfur contents. Dilution of the viscose solutions increased the rates. A molar activation energy of 23 kilocalories was calculated for a pine kraft pulp with a high alpha-content. Changes in S.i., with respect to the degree of substitution (D.S.) at 25°, followed the same linear function. With viscoses formed at lower xanthation and/or lower temperatures, the ripening curves showed an initial rise, which suggested dexanthation and a randomizing substitution. Xanthation in two stages in which the final step was made under practically homogeneous conditions gave a viscose with random substitution and exceptionally high S.i. As this solution ripened, the S.i. decreased linearly with respect to D.S. and finally followed the function of a normally xanthated viscose. Thus it was apparent that the final internal structures of the two solutions were similar.

A New Method for Removal of Xanthate Groups in Carbohydrates and the Chemical Structure of a-Methylglucoside Xanthate and of Viscose was reported by J. J. Willard, a co-worker with Professor Eugene Pascu of Princeton. Details were given for locating the position of the xanthate group in carbohydrates by classical methods. In the case of the glucoside, the xanthate was on carbon atom 6, isolated as the crystalline S-benzyl ester. This was converted into the tribenzoate, from which the xanthate ester was removed gradually, giving the known 2, 3, 4-0-tribenzoyl a-D-glucoside. The method used for this model compound was also applied in attempts to locate xanthate groups in both green and ripened commercial viscose. The green viscose gave unsatisfactory results. In the ripened viscose, the benzoylated cellulose xanthate was followed by methylation and hydrolysis, and chromatographic methods were used in estimating the positions and amounts of the resulting monomethylglucoses. Apparently in the case of the commercial viscoses, the xanthate groups had been distributed at positions 2, 3 and 6 of the glucose units in the original cellulose.

The Oxidation and grafting of Benzyl-and Ethyl Cellulose comprised the work of Edward H. Gleason and Professor Vivian Stannett of the New York State College of Forestry, Syracuse. This was attempted through the initiation of vinyl polymerization by cellulose ether hydroperoxides. Unfortunately in the preparation of graft co-polymers, the actual amount of grafting was very slight and poor yields were obtained. These were attributed to unfavorable competition in the reactions involving initiation and chain transfer, and to the degraded chain length of the cellulose ether hydroperoxide.

The Absorption of Glycerol Solutions by Regenerated Cellulose was studied in the laboratories of the Olin Mathieson Chemical Corp. in New Haven. Results were reported by Erc Wellich and represented his work and that of R. Mykolajewycz,

R. N. Lewis and O. J. Sweeting. Various concentrations were used and the gycerol and water were absorbed by the cellulose films in practically the same ratio in which they occurred in the initial solutions. No affinity for glycerol over that for water prevailed.

The Apparent Activation Energies of Hydrolysis of some Cellulose Materials were calculated by Mary L. Nelson of the Southern Regional Research Laboratory, and those calculations were carried out separately for amorphous and crystalline regions. Dr. Nelson found a linear relationship between hydrolysis rate and acid concentration.

The Alkaline Hydrolysis of Representative Palms was described by Dr. I. A. Pearl of the Institute of Paper Chemistry. Petioles of 26 palm species were studied. In all cases, p-hydroxybenzoic acid was the chief product; all yielded vanillin, syringaldehyde, acetovanillone, acetosyringone, vanillic acid and syringic acid. Individual species also gave rise to other components, some of which remain unidentified.

Symposium on Chromatographic Analysis

Following these individual papers came the **Symposium on Chromatographic Analysis of Cellulosic Matetials.** This meeting was spearheaded by Dr. Jerome F. Saeman of the Forest Products Laboratory, a pioneer in applying this field to the analysis of paper pulps. An article on the **Paper Chromatography of Radioactive Carbohydrates** was the work of Lorna J. Tregoning and Harriet L. Frush, National Bureau of Standards, and was presented by Dr. Frush. In their hands, paper chromatography proved to be a versatile tool, since radioautographs of carbohydrates containing carbon-14 gave excellent "maps" of the location of the products (and their impurities). Techniques were described in detail. The detection of tritium-labelled materials, which have a low energy of beta-radiation, was not too successful, although certain modifications overcame some of the difficulties. Macro-separations on heavy papers carrying 0.5 to 3 g. of material proved very useful. The monitoring of radioactive materials and their purifications were outlined.

The Degradation of Cotton in an Oxygen Atmosphere by Gamma-radiation was described by Florine A. Blouin and J. C. Arthur Jr. of the Southern Regional Research Laboratory, New Orleans. Major structural changes included the formation of reducing and acid groups, and the evolution of hydrogen, carbon monoxide, and carbon dioxide, as well as the cleavage of cellulose chains. Low-molecular weight cleavage products were glucose, cellobiose, and a series of related oligosaccharides, arabinose, 2-ketogluconic acid, glyoxal, and various unidentified substances, picked up on paper chromatograms. From the same laboratory came a report on **Ion-exchange Cellulose for Chromatographic Separations,** prepared by Drs. J. D. Guthrie and Austin L. Bullock. The production of anion exchangers included aminoethylated- and diethylaminoethylated-celluloses. Cation exchangers were sulfoethylated,- phosphorylated,- and phosphonomethylated-celluloses. These could be prepared in the form of fabric, yarns, pulp or paper. Cross-linking of the cellulose before or during chemical modifications, gave the products higher exchange capacities.

The following papers, interesting and important as they were, are given only by title because their bearing on cellulose chemistry is remote or indirect. Drs. R. M. McCready and Mildred Gee, Western Regional Laboratory, Albany, California, reported on the **Composition of Some Pectic Substances.** From the laboratory of Professor Jones, Queens University, came the studies on **Separation of Oligosaccharides on Ion-exchange Resin Columns** by Drs. R. A. Wall and A. O. Patet, the work of Dr. H. H. Sephton on the **Enzymic Synthesis of an Octulose,** and that of Dr. G. H. S. Thomas on the **Structure of Asafoetida Gum.**

Paper Chromatographic Pulp Analysis by Relative Concentration Densitometry was described by C. Warburton of the Eastman Kodak Laboratories, and included the work of L. Weisler. The usefulness of this technique in determining glucose-mannose-xylose ratios on paper chromatograms was emphasized. Streaks from solutions of 150 to 200 gammas per cc. were applied to paper strips, developed, using butanol-pyridine-water (10:3:3), and sprayed with aniline phthalate for density tracing, using a Kodak reflection densitometer. The statistical evaluation of sugar recovery data was also discussed.

When carbohydrate derivatives are sufficiently volatile, they can be separated qualitatively and quantitatively by **Gas-Liquid Partition Chromatography.** This was explored by Dr. C. T. Bishop and F. P. Cooper of the National Research Council in Ottawa. They described the separations of methylated methyl glycosides, methylated sugars and of the acetyl derivatives of sugar alcohols. The value and the limitations of this method for identifying and determining such components were outlined, and special emphasis was placed on its application in studying the structure of the polysaccharides.

Unfortunately neither Professor Georg Jayme nor Herbert Knolle of the Technische Hochschule in Darmstadt, Germany, were present at the Meeting, but an abstract of their work on the **Quantitative Determination of Sugars by Direct Ultraviolet Photometry of Paper Partition Chromatograms** was read by Dr. M. A. Millet. The photometer used (Elphor-Integraph, made in Munich) was automatic and self-registering. The method proved useful in pulp analyses. The pulp hydrolyzates were deacidified by means of an ion-exchanger, concentrated *in vacuo* to a definite volume, chromatographed, and evaluated. In this way xylans and mannans in a pulp could be determined with a precision of about ∓ 5 per cent. Provided the chromatograms were sprayed with methyl salicylate and evacuated, they were rendered transparent and could be evaluated photometrically. However, by sacrificing the precision somewhat without developing this transparency, by the application of another light filter, they could still be evaluated. The chromatograms could be preserved by impregnating with a polystyrene solution.

An excellent review of previously published work on **Column Extrusion Chromatography** was given by Prof. M. L. Wolfrom and Dr. A. Thompson of Ohio State University, who have applied this technique with signal success in many of their own researches.

Finally, Drs. Wayne E. Moore, M.A. Millett and J. F. Saeman gave a progress report on the results of the Joint A.S.T.M., A.C.S. and TAPPI Committee on Chromatographic Methods. A round-robin test program had been inaugurated, and the data showed rather wide differences in the performances of the laboratories taking part in the study. Recent experimental procedures were described and certain recommendations were made.

Bowaters

(Continued from page 632)

ment consisting of conveyors, feeders, bucket elevators, etc.

Lime is reburned in a 10 ft.-dia. by 265-ft. long kiln designed to burn 120 tons of lime per day.

Temperatures in the causticizing operation are controlled by a Multi-Record Dynalog system. A 6-in. magnetic flow meter regulates flow of green liquor to the slaker.

Power and steam generation

In addition to the recovery boiler described under chemical recovery, a two-drum, sterling-type combination bark-oil-and-gas burning boiler, equipped with full water-cooled furnace and Rotograte spreader stoker, has a steam capacity of 300,000 lb/hr. at 850 psi pressure and 900°F at the superheater outlet. The boiler has a capacity of burning 75,000 lb. of bark per hour.

The boiler features a spray type attemperator, located in the steam line between the first and second stages of the superheater, which maintains steam temperature at 900°F. A forced draft fan, driven by a 350-hp induction motor, delivers 143,000 cfm of 100°F air. The induced draft fan, driven through a hydraulic coupling by a 900-hp motor, has a capacity of 308,000 cfm of 470°F gases. The boiler further features a horizontal continuous tube economizer, a dust collector and manually operated steam soot blowers.

Water is supplied to the boiler by three 6HMTA-6, 1,200-gpm, split-casing type boiler feed pumps. Two of the pumps are driven by 1000-hp Terry steam turbines and one by a 1,000-hp electric motor.

The boiler is controlled by (1) automatic firing control of the combination fuels; (2) automatic fuel flow-air flow ratio and air flow distribution; (3) automatic furnace draft control; (4) three-element steam temperature control; and (5) three-element feed water control. An oxygen and combustion analyzer-recorder is used to insure proper combustion conditions.

Electric power is generated by a 12,500 KW, single, automatic, 150-psi extraction, condensing turbine generator. The turbine is designed for initial steam conditions of 850 psi pressure, 900°F temperature, and 2½ in. Hg back pressure. Steam from the turbine exhaust is condensed in a 9,000 sq. ft. horizontal, two-pass, radial flow, deaerating type surface condenser, through which passes all the water used by the new pulp mill. The condenser is served by two condensate pumps, a twin two-stage steam jet air pump and a hogging jet.

The deaerating heater is a 900,000 lb/hr spray tray heater with an 8-ft. dia. by 17-ft. long horizontal preheat section, operating at 65 psi pressure. It is equipped with stainless steel spray valves, stainless steel tray banks and stainless steel hood for the spray section.

The tubo-generator is served by a dry-type turbine oil conditioner which features (1) a precipitation compartment equipped with screens and automatic water ejector; (2) a filtering compartment consisting of seven gravity filtration type units; and (3) a storage compartment of 120 gal. capacity, also containing a secondary or polishing filter which removes from the oil particles of 1-2 microns in size including vapor haze or vapor clouds. The unit operates on a continuous by-pass hook-up arrangement whereby 270 gal. of oil, of the 930 gal. turbine reservoir capacity, can be recirculated continuously every hour.

Effluent disposal

The effluent disposal system includes two sedimentation basins served by a single canal from the plant effluent system and a diversion structure which can divert effluent flow to either of the sedimentation basins across a continuous 460-ft. long weir plate and over a rough 50-ft. long concrete apron to obtain maximum aeration of the effluent material.

At the discharge end of the sedimentation basins, effluent flows across another 750-ft. long weir and over a concrete apron to the stabilization basin. The stabilization basin is separated from the Catawba River by a large dike. Effluent from the stabilization basin into the river is controlled by a 48-in., Fiberglass-lined magnetic flow meter and adjusted to the river flow. A float-and-cable instrument at the river provides a continuous measurement of river flow which is telemetered over a distance of two miles where it sets the waste flow controls to maintain the desired river-to-effluent ratio. Effluent enters the river through a 385-ft. long diffusion line equipped with thirty-four 8-in. dia. nozzles with flap valves to provide equal distribution of effluent across the river.

Dust removal

(Continued from page 635)

even the very fine particles in the low micron range will be collected and not escape to atmosphere.

The solid waste now collected as sludge in the settling tank are dumped automatically, through a sludge pump, into the sewer system. The dump and ejection cycle is automatically controlled and may be set to operate cyclically with timer controls, which also governs replacement of the discarded water. Since all impingement water is on a recirculating basis from the settling tank, there is no water demand for this purpose. This recirculation is made possible by a set of screens and baffles which are automatically backwashed and cleansed during the dump-ejection-to-sewer cycle, which takes place for only a few minutes once or twice a day. Therefore, the total amount of make-up water may be held to a few hundred gallons a day.

In another installation where water was not considered to be a high cost and where sewage loads did not have to be considered, a much simpler design was used. This design also automatically ejects the sludge waste, but on a continuous basis with the use of a water jet ejector system instead of a sludge pump. This further simplifies the installation requirements, operating as it does by means of supply water pressure which is constantly available.

A natural consequence of both the Antioch and Los Angeles installations at Crown Zellerbach Corp. has been the air conditioning itself, which occurs as a result of the mild circulation of air in and around the machines. It is in reality an excellent air conditioning unit, with mild, fresh air currents providing an exceedingly high comfort level for personnel even under adverse outside weather conditions.

Valid proof of the purity of the new air condition was provided when independent testing laboratories made "before and after" dust count measurements. Typical dust levels which were in the order of 50 mg. per cu. meter are now at the low 1 mg. range.

Adhesives

(Continued from page 633)

natural adhesives such as starch, dextrine, glue, casein or soya protein.

Styrene-butadiene latex has become the all-purpose latex binder in paper coatings, although for some special applications other latices, e.g., acrylics, are also being used. Styrene-butadiene has won this acceptance because it combines a number of excellent properties with the advantage of reasonable cost.

There are now scores of styrene-butadiene latices available on the market, with differences in the styrene-butadiene ratios, the types and quantities of emulsifier used, the size of the

(Continued on page 652)

PROFIT IN THE MAKING

These big, latest model Vickery Felt Conditioners will soon be helping a huge, high speed paper machine to pay maximum return on its investment.

They will keep every inch of the press felts continuously clean and open, eliminating midweek shutdowns for felt wash-ups, and assuring utmost moisture removal at the presses where it costs least.

The conditioners pictured are equipped with traveling headers and are hydraulically driven, with remote control panel for easy adjustment to the speed of the felt.

Whether you're operating new machines or old, high speed or slow, wide felts or narrow, *you need Vickery Felt Conditioners to make better paper and more of it per day at lower cost per ton.*

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CURRENT COMMENTS

World conference in Rome—Tariff conference in Tokyo

It will cost one billion dollars a year from now until 1965 to provide new paper making capacity to meet the world's expected demand for paper and paperboard. It will cost an average of one and a half billion dollars a year for the years from 1965 to 1975 to supply the anticipated, pyramiding world consumption of these products. Approximately half of the expected investment will be required of North America and Western Europe.

WARREN B. BULLOCK

These were the salient features of a world conference on "Pulp and Paper Demand, Supply and Trade" held at Rome in October under the auspices of the Food & Agriculture Organization of the United Nations. The conference, attended by leading representatives of the paper industry from the United States and Canada, was presented with a world wide survey of the present producing facilities and the projected need for additional capacity to meet the anticipated world demand.

The estimated demand in 1965 is given as 88,000,000 metric tons and expansion plans already underway are expected to be sufficient to meet the major part of the increased demand. By 1975, however, the estimates reached the astronomical total of 134,000,000 metric tons.

On the question of available raw material in forest reserves, the conference was told that in North America there is no present danger of the lack of sufficient pulpwood. In other countries, however, the situation is more acute. This problem was said to be particular difficult in Eastern Europe, the Near, Middle and Far East.

Discrimination ended?

Statements by the United States representatives at an international tariff conference at Tokyo, coupled with action by the International Monetar Fund, which implied a return to a protectionist attitude by the United States, were followed by immediate action by Great Britain and France as well as by other nations to end discrimination against United States merchandise. Great Britain, for instance, announced that its quota limitations on imports of paper and paperboard from the United States would be eliminated. These actions merely end specific discrimination against United States products, but do not alter the imposition of normal duties on such shipments.

At Tokyo, the United States indicated strongly that it would take a new look at its policy of reciprocal trade agreements if discrimination against United States merchandise continued. Assistant Secretary of Commerce, Henry Kearns said: "It is our national policy to share our markets with producers abroad, not to give our markets away." In addition to Britain and France, Austria, Australia and Japan have also taken steps to modify their antagonism to imports from the United States.

Disposable paper clothing ranks high

An elaborate display of disposable paper work-clothing featured the annual convention of the Quartermaster Association at New York in October. The display was the exhibit of the U. S. Army Quartermaster Research & Engineering Command at Natick, Mass. Throw-away clothing of paper for mechanics, painters, cooks and bakers, as well as surgeons and other medical corps personnel, rank high on the recommendations of this governmental agency for military use. In addition to the display of clothing, the exhibit included a paper tent with paper flooring, and a variety of displays of paper and foil for the packaging of food and emergency supplies.

Ownership changes

Corporation reports for the first nine months of the year, now becoming available, indicate rapid increases in sales and profits as compared with 1958, many of the reports showing gains of up to 40 per cent in net income. Stockholder sharing in these profits included an increase in the Scott company's quarterly dividend rate from 50 to 55 cents per share, and a split of two-for-one in Paper Craft Corp. stock. Nekoosa Edwards declared a 5 per cent stock dividend in both voting and non-voting stock. Union Bag-Camp Corp. declared an extra dividend of 30 cents per share in addition to the usual quarterly rate of 30 cents payable in December.

Georgia-Pacific Corp. which included large scale paper production in its forest products activities, has announced that the company's acquisition of the Booth-Kelly Lumber Co. at a cost of $93,000,000, will add upward of $5,000,000 a year to the company's net income. Georgia-Pacific has sold about a quarter of the timber acreage secured from Booth-Kelly for $53,000,000, and the balance will be kept on a sustained yield basis for future lumber and paper production.

A merger of two prominent Kalamazoo companies is in prospect, the combination of Kalamazoo Vegetable Parchment with the Sutherland Paper Co. involving a total annual sales of well over $100,000,000. Under the proposal the holders of KVP common stock will receive 1.2 shares of the new company (to be known as KVP Sutherland Paper company) for each share of KVP and Sutherland stock holders will receive one-for-one. The merger will put together a basic paper producer and an outstanding converter.

St. Regis is to issue new stock in payment for Birmingham Paper of Birmingham, Ala., producer of school supplies and corrugated box products. The merger agreement puts a price tag of about $4,500,000 on the Birmingham company.

Albemarle Paper Co. is taking over the Richmond, Va., Container company. Federal Paper Board has purchased the Sweeney Lithographing Co. of Belleville, N. J., and Brown Co. has acquired a controlling interest in

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NO LUBRICATION NEEDED—The spherical seating seal, which is under compression, is self-adjusting for wear and readily replaceable when required. A distinctive external signal makes it possible to determine, in advance, when maintenance and seal replacement is advisable.

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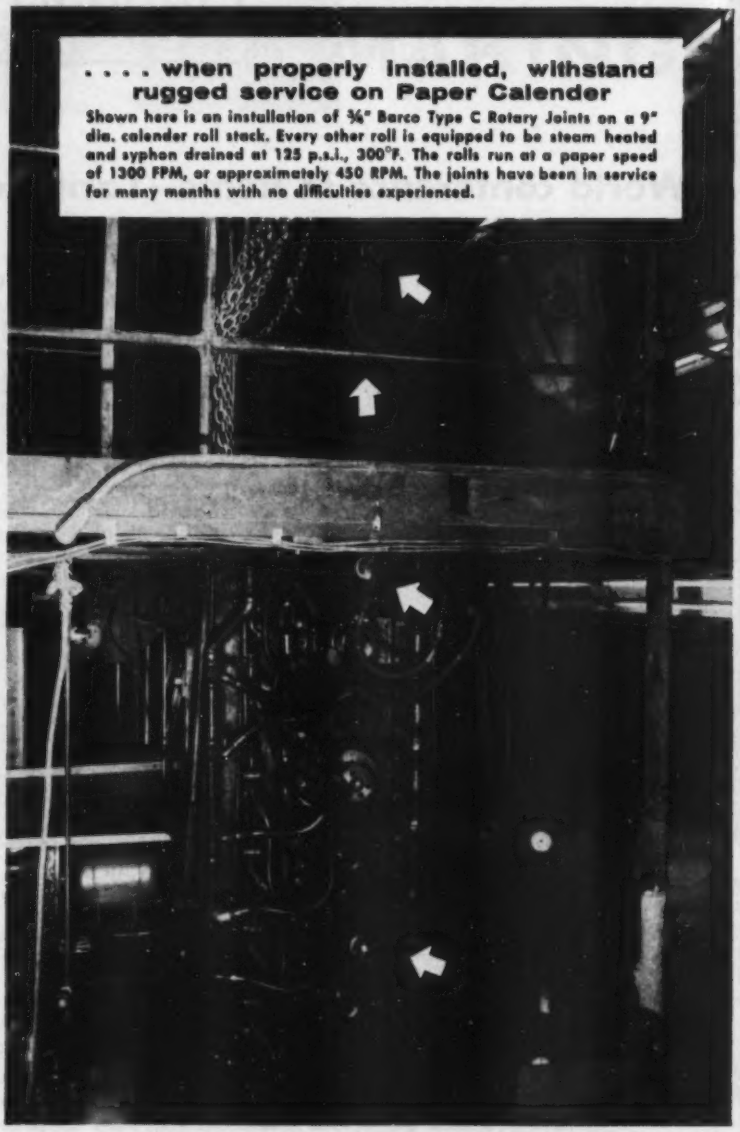

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Shown here is an installation of ¾" Barco Type C Rotary Joints on a 9" dia. calender roll stack. Every other roll is equipped to be steam heated and syphon drained at 125 p.s.i., 300°F. The rolls run at a paper speed of 1300 FPM, or approximately 450 RPM. The joints have been in service for many months with no difficulties experienced.

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For countless applications, Barco's new Type C Rotary Joint will give you the best operating records you've ever had—*and for LESS COST!* Special treatment on the rotating sleeve minimizes corrosion, friction, and wear. This feature is standard with Barco at no extra cost. Stainless steel spring is also standard.

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Current Comments . . .

the Resi-Chem Corp. of Swanton, Ohio, whose product is largely used in Brown's converted products.

A protest by minority stockholders has for the time being delayed the acquisition by United Board & Carton Co. of the Interstate Container Corp.

Financial report

The feeling that the prolonged steel strike will continue to have an adverse effect on the national economy for months to come brought all Wall Street securities to a lower range, and practically all paper company issues suffered from the prevalent pessimism.

Allied Paper Corp.—Net income for nine months, $1,259,178; a year ago, $30,699.

American Writing Paper Corp.—Net income for nine months, $462,-151; a year ago, $471,193.

Certain-Teed Products Corp.—Net income for nine months, $1,063,474; a year ago, $877,179.

Rayonier Inc.—Net income for nine months, $10,383,449; a year ago, $4,-360,160.

Chesapeake Corp. of Virginia—Net income for forty weeks, $2,897,012; a year ago, $1,993,180.

Container Corp. of America—Net income for nine months, $12,750,000; a year ago, $10,693,000.

Crown Zellerbach Corp.—Net income for nine months, $28,966,000; a year ago, $23,440,000.

Federal Paper Board Co. Inc.—Net income for 36 weeks, $3,120,000; a year ago, $3,008,000.

Great Northern Paper Co.—Net income for 40 weeks, $1,082,085; a year ago, $326,348.

Glatfelter, P. H., Co.—Net income for nine months, $1,704,495; a year ago, $1,203,476.

Hammermill Paper Co.—Net income for 39 weeks, $2,161,258; a year ago, $1,682,394.

International Paper Co.—Net income for nine months, $60,422,244; a year ago, $48,000,164.

Masonite Corp.—Net income for year ended August 31, $5,589,460; a year ago, $4,344,412.

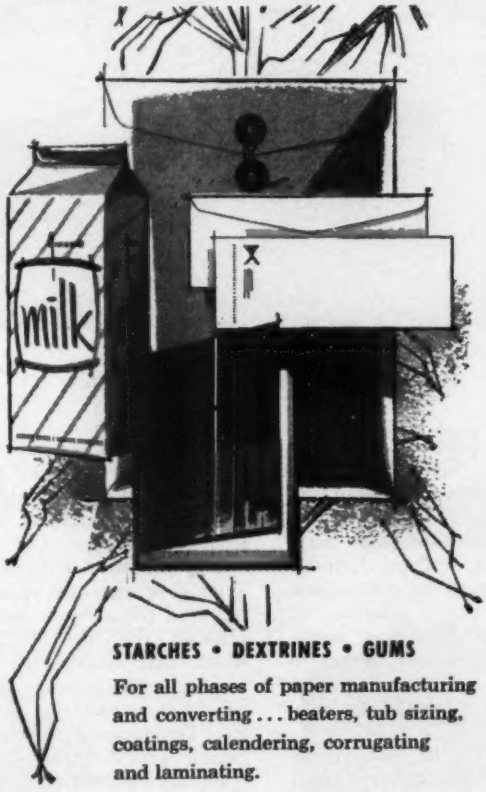
Mead Corp.—Net income for 40 weeks. $10,427,251; a year ago, $7,-950,073.

Minnesota & Ontario Paper Co.—Net income for year ended September 30, $5,887,501; a year ago, $5,-408,892.

Nekoosa Edwards Paper Co. Inc.—Net income for nine months, $2,376,-911; a year ago, $1,664,926.

(Continued on page 653)

Look what happened to the corn we took off the cob



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NEWS of the INDUSTRY

Papermaking Display Found Useful

The Wisconsin paper manufacturers have developed a new portable exhibit on the art of papermaking and have found it very useful.

Members of the Information Service of the Wisconsin Paper Industry developed the exhibit for use in joint community and public relations in Wisconsin. The exhibit proved worthwhile and the members decided to offer models to manufacturers and other industry-oriented firms throughout the country.

The display tells, in four vividly colored panels with various small turning machines, the story of paper from forest to finished product.

In operation, a small motor controls the movement of all the incorporated animated machines—barking drum, chipper, digester, pulp lap machine, jordan, rotary screen, fourdrinier, calender stack, etc. A record, which can be played on any phonograph with 33 1/3 rpm speed, goes with the display. Or, if users prefer, an oral presentation can be made. In some cases, such as window displays, simple signs explaining the workings of the various machines suffice.

The exhibit weighs about 45 lb. and, unfolded, extends 12 ft. It is 15 in. high and 3¼ in. deep. It folds for carrying purposes, to 6 ft. in length.

The 21 major Wisconsin firms belonging to the association have felt the need for a small, handy unit explaining the art of papermaking which they could loan to schools, use as a speech prop, as a training aid, as an introduction to plant tours, etc. Development of this portable exhibit provided the answer.

Further information concerning this unit is available by writing to: Information Service, Wisconsin Paper Industry, 104 N. Commercial St., Neenah, Wis.

Institute of Paper Chemistry Receives Gift of $30,000

The Louis Calder Foundation has presented the Institute of Paper Chemistry with a gift of $30,000 for the establishment of a modern electron microscopy and diffraction laboratory.

The new instrument, provided by the Calder gift, will make more efficient use of time for research and will permit diffraction studies not now possible. It will also enable personnel to do advanced research on papermaking fibers—their structure, surfaces and bonding. Results of this research would in turn be useful in forest genetics, pulping, coating and other papermaking operations.

Waste Material Dealers Change Name

Beginning June 1, 1960, the National Association of Waste Material Dealers Inc., will use a new name—National Association of Secondary Material Industries Inc. (NASMI).

The directors of the 46-year-old organization felt that the new name will define more clearly the nature of the association which is composed of several secondary material industries.

Clupak Organizes International Licensing Program

A unique, worldwide licensing program is now being organized by Clupak Inc. under which licensee paper companies will share with one another their research advances and technical know-how in manufacture of the new Clupak paper.

Under this new program the following has been reported:

(1) Manufacture of Clupak paper, under quality standards set by Clupak Inc. and under its trademark and patents, is open to any paper company throughout the world at a fixed royalty fee; this fee is identical for every company and every country. Patents already have been filed in 35 foreign countries and the trademark Clupak is registered in over 50 countries.

(2) Clupak Inc. not only is making available the fruits of its extensive research and all its own technical know-how in manufacture of the extensible paper, but also will pass on to every company under license, information on all advances by any other company in the field. Any licensee whose own research on the new type of paper yields new patents dominated by existing Clupak patents adds these new patents to those previously available to other licensees throughout the world.

(3) Each paper company licensed to make Clupak paper may sell its

This **Pandia System**

Proved Best for Neutral Sulphite Corrugating Pulps

The name Pandia appears on more corrugating pulp digesters here and throughout the world than any other name.

That's because Pandia is the recognized leader in the development of equipment for neutral sulphite pulp. Pandia has the experience... supplies standard pulp mill equipment that has proved itself by producing results.

This highly regarded system begins with the Pandia Chemi-Pulper continuous digester and includes blow tank, agitators, pumps, the Breaker Trap, Refiner and Washer... all by Pandia.

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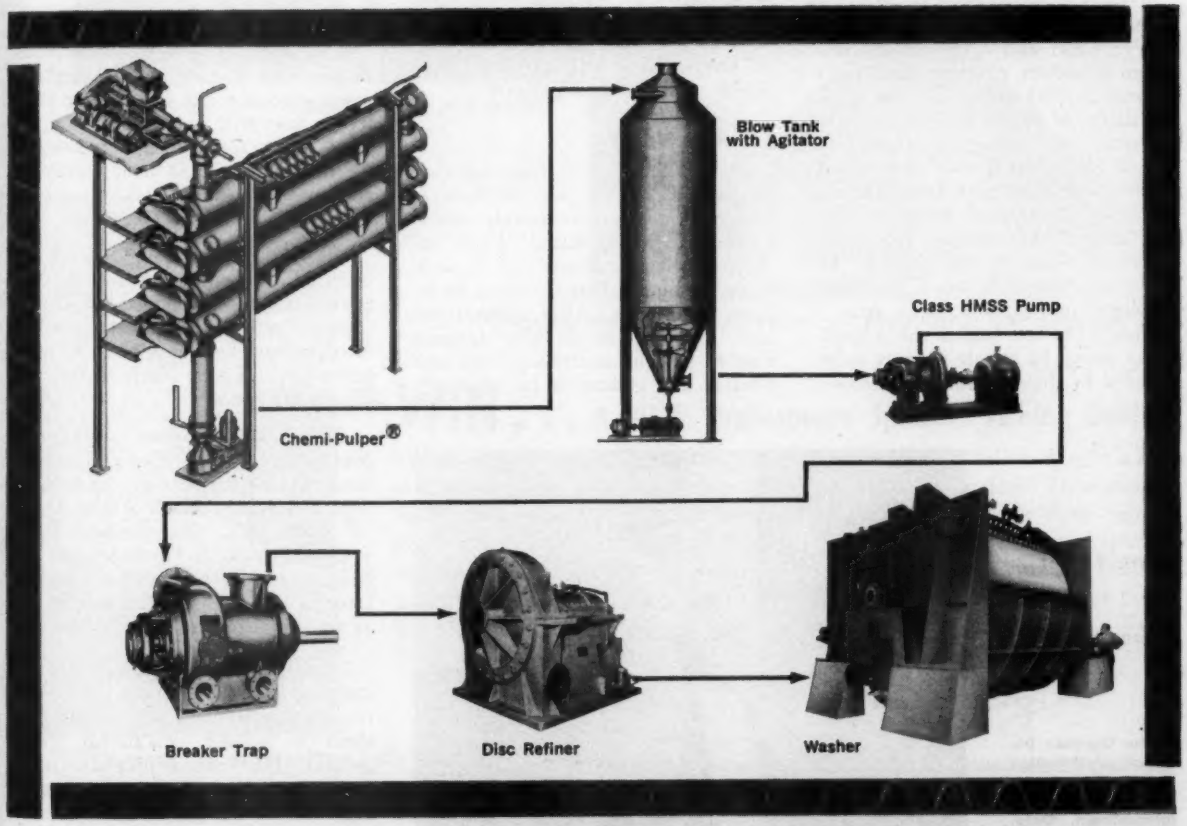


Co-ordineered Pulp Mill Equipment

product anywhere in the world in competition with other licensees.

(4) Clupak Inc. protects the Clupak trademark — both legally and technically as to the quality of the Clupak paper produced; sends its technical men out to train personnel of the licensee company; helps licensees market, sell and promote the use of Clupak paper; and sponsors extensive research and development projects.

Finch, Pruyn Presents New York with Land Gift

The state of New York has received a land gift of 2,800 acreas in the Adirondacks from Finch, Pruyn & Co. Inc., of Glens Falls, N.Y. This particular area is valuable to the state as it is already surrounded by other state-owned land.

A number of other such gifts has been made in recent years by Finch, Pruyn: 1,805 and 670 acres at Santanoni Mountain, enabling the state to increase its park areas; 2,000 acres at the village of North Hudson for public hunting and fishing under the Fish and Wildlife Management Act passed by the New York State Legislature in 1957; and 2,093 acres along the Fulton Chain to the Syracuse University School of Forestry and area to the Town of Newcomb which has been developed into a public picnic area.

This is the first land in the Adirondacks owned by private industry to be accepted by the state for this purpose.

Career Guidance Committee Holds First Meeting

The first meeting of the Paper Industry Career Guidance Committee was held in the New York offices of the Oxford Paper Co.

This committee, whose objective is to attract and guide young people toward careers in the pulp and paper industry, plans to produce materials and programs which will inform young people of the employment and career opportunities in the industry and to encourage everyone in the industry to use the Committee's services, distribute materials it produces and participate in its programs. Specific plans and programs will be developed at future meetings.

Invitations are being sent out by the committee to interested pulp and paper industry organizations to join with them as members of the committee.

Officers elected were: Walter B. Morehouse, vice president of Nopco Chemical Corp., was elected as chairman; Harris O. Ware, technical manager of Beveridge Paper Co., will serve as vice chairman; and Theodore H. Davis, public relations director of APPA, will serve as secretary.

Forestry Notes

The U. S. Borax & Chemical Co., St. Regis Paper Co. and the Georgia Forestry Commission recently tested a chemical fire retardant (which includes sodium, calcium and borate) in the Suwannee Forest, owned by St. Regis in Georgia. After a forest fire had been set, an ex-Navy torpedo bomber flew in at tree-top level and released 220 gallons of the chemical. The progress of the fire was stopped in minutes. The chemical doesn't extinguish a fire, but cools it down so heavy ground equipment can move into the area.

An increase of over 1,500,000 acres since the beginning of this year has brought the total acreage in tree farms to 50,127,379 acres as of the first of September, 1959. For this same period, tree farms have increased from 13,935 to 15,798. Mississippi has the greatest number of tree farms —1,952; and Florida has the largest area in tree farms—4,918,359 acres.

The Cordele Forestry Research Center and the Athens-Macon Research Center have been consolidated. It is now called Macon Research Center. W. A. Campbell is leader of the combined installation.

Walter R. Swanson, vice president of research and development for Kimberly-Clark Corp., Neenah, Wis., received the University of Minnesota's outstanding achievement award.

The use of bentonite has been found to be of great help in checking many serious forest fires. After plastering trees with this liquid in a fire zone, it was found to be effective for 24 hrs. Bentonite is used chiefly to control the viscosity or stickiness of oil well drilling.

The first three-phased study of the effect of commercial fertilizer on pine trees is now being conducted in Dodge county, Ga. Various combinations of fertilizer have been applied to 25 half-acre plots and each one has been replicated five times.

Ben Meadows, owner of the Ben Meadows Co. in Atlanta, Ga. has been elected president of the University of Georgia Forestry School Alumni Association. Other officers are: J. D. Strange, U. S. Forest Service, Atlanta, as vice president; Sam Thacker, Georgia Forestry Commission, Macon, as secretary-treasurer.

University of Georgia officials are studying a proposed new curriculum for forestry students which will give them a broader educational background. The revised program, more flexible and at the same time more vigorous, would reduce the number of required forestry courses. This will give each student time to study technical and cultural subjects elsewhere in the university. The goal would be to equip foresters to advance more rapidly in the ranks of management and to cope more effectively with the complex problems they face in their careers.

Print Tester for Paperboard

The Gardner Division of the Diamond Gardner Corp., located in Middletown, Ohio, has developed a machine to accurately predict the printability of paperboard. The device is essentially a bench model gravure press that includes special design features for testing paperboard. The new product is the result of four years of research and provides a numerical smoothness rating by counting the dot misses through the use of a specially designed template, eliminating the problems of subjective judgement entirely. Print Smoothness Tester is the name given to the product.

*What place reminds YOU of HAMILTON Felts?

"Reminds me that the makers of Hamilton Felts are pretty fast too"

"Reminds me how Hamilton Felts run water"

"Reminds me of Hamilton Felts . . . They last a long time too"

Photos by
Ewing Galloway, N.Y.

"Reminds me of Hamilton Felts . . . You can depend on them too"

*WIN . . . A NEW Shakespeare Spincast Fishing Outfit!

"What famous landmark reminds you of Hamilton Felts? Tell us why in a few words, sign your name and address and name of your company. Then send it in. The best reason this month by a paper maker wins a new 1960 model Shakespeare Spincast Rod and Reel — FREE ! Every paper maker entrant receives a famous Rex Spoon fishing lure — FREE ! These pictures of famous landmarks might start your 'think tank' to working. Don't copy any of those you see here — but send me *your* suggestion — today! 612 First National Bank Bldg., Cincinnati 2, Ohio."

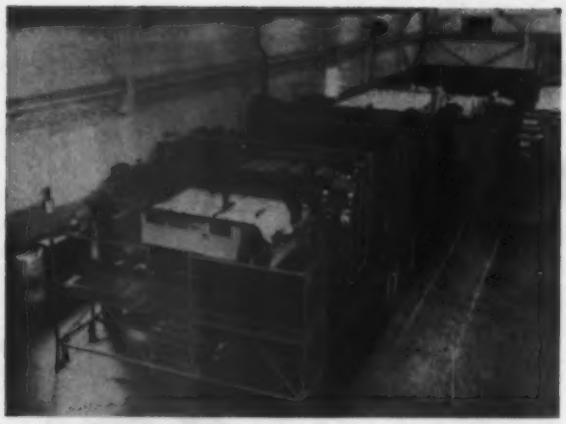
Ham Feltz

Want to save money on downtime?
Ask your Hamilton Felt Service Salesman.

SHULER & BENNINGHOFEN
HAMILTON, OHIO

YOU CAN'T BEAT
Hamilton
FELTS

Recent Expansions in the Industry



New rotary cutter installed at Finch, Pruyn converts rolls of paper into sheet stock.

Finch, Pruyn sheet handling equipment — a revolutionary new method of handling paper through the trimmers from skid to skid without lifting a sheet of paper.

Finch, Pruyn Finishes Modernization of Finishing and Converting Department

As the new addition to the stock storage area receives its finishing touches, complete modernization of the finishing and converting department will be finished at plant of Finch, Pruyn & Co. Inc. located at Glens Falls, N.Y.

The entire layout was designed for efficiently processing the output of three paper machines capable of turning out many different types of paper. Principal grades of paper produced include: bleached, uncoated printing papers for letterpress and rotogravure; surface-sized uncoated stock for offset and duplicating processes; surface-sized bonds and writing papers for business forms, adding machines rolls and tablets. These grades are made principally of hardwood neutral sulfite pulps.

One of the converting sections in the finishing set-up is horseshoe in shape, with levelators, roller conveyors, air-flight, off-table and other components properly placed for speeding the paper to the carton or skid packing operation, and keeping manual lifting to a minimum.

A newly installed 10-roll Clark-Aiken cutter sheets 114-in. rolls at 550 fpm and is supplemented with a 110-in. Hamblet cutter. Moisture-addition equipment keeps controlled relative humidity during winter months.

A Hayssen ream sealer and an ABC carton sealer set up in line to receive paper cut by a new Seybold 65-in. trimmer and Brackett trimmer provide fast efficient production of 8½ by 11 and 8½ by 14 sizes of bond, offset, mimeo and duplicator.

Skids are wrapped and strapped more quickly and efficiently with overhead Strapping tools and wire reels.

This stock storage area is part of the large storage facilities recently completed.

Reams of Finch, Pruyn paper are automatically cut, wrapped, sealed, labeled and put in cartons on this converting line.

$20 million Pulp Mill for Brazil

Champion Celulose, S. A., a Brazilian corporation, has been given help to finance the construction and operation of a bleached sulfate wood pulp mill in Brazil. A total of $4 million has been invested — $1,050,000 will come from the International Finance

Corp.; $2 million for Deltec Corp. of New York; $750 thousand from the Chemical International Finance Ltd.; and $200 thousand from Bankers International Corp.

The plant, located at Mogi Guacu in the state of Sao Paulo, is now under construction and is expected to start operations late this year. Eucalyptus will be used for pulpwood at the plant and the pulp produced will be sold to Brazilian paper manufacturers for use primarily in the production of white papers such as printing and writing grades. Forest plantations are also being acquired and developed to support this production.

Richmond — Home for New Du Pont Plant

Richmond, Va., will be the new home for Du Pont's first major plant for the manufacture of polyethylene film for packaging.

The new unit will be housed, for the most part, in buildings formerly used for rayon production. An addition will be constructed for production equipment.

Noralyn to Build in Baton Rouge

A 750-acre tract in West Baton Rouge has been purchased by Noralyn Paper Mills Inc. for the building of a $40 million pulp and paper mill.

The new mill is said to have a capacity of 400 tons of pulp per day when in production. It will produce pulp and newsprint paper of high quality exclusively from various species of scrub hardwood timber.

New Container Plant Opens in California

The American Forest Products Corp. has just opened a new plant in Santa Fe Springs, Calif. It is the second corrugated container plant of the corporation in California.

A Swift corrugator, an 87-in., heavy-duty machine and two Hooper printer-slotters, all furnished by the Metal Products Div. of Koppers Co. Inc., are among the equipment installed at the new plant.

Formal Opening at Catawba

Formal opening of Bowaters Carolina Corp.'s new Catawba, S. C., pulp mill took place on October 9.

Costing some $37 million, the mill started production on July 12. One feature of the new mill is a Swedish pulp dryer — said to be the first of its type to be placed in operation in North America. In this giant machine the wet pulp fibers are locked together and formed into a continuous sheet. The sheet is floated through the machine on hot air instead of the conventional belts.

Grays Harbor to Install Paper Machine

Over $10,000,000 will be spent for the installation of a new high-speed paper machine and related papermaking facilities by Grays Harbor Paper Co. at its paper mill adjacent to the Rayonier pulp mill in Hoquiam, Wash.

The project is to be completed in late 1961, and will increase the plant's capacity from 30,000 to 70,000 tons annually as well as broaden the line of fine and printing papers.

Columbia Cellulose Forms New Company

The Columbia Cellulose Co. Ltd. of Vancouver has announced the formation of a new company to be named Columbia Pulp Sales Ltd.

Products of the Prince Rupert mill of Columbia Cellulose (which manufactures bleached sulfite dissolving pulps and high alpha specialty pulps) will be distributed by the new company.

The company will also market Celgar Kraft pulps which will be available by the spring of 1961 from the new mill now under construction in the Arrow Lakes District of British Columbia.

Dependability is more than a virtue. It's often the difference between profit and loss. Albany Felt takes special pride in the long history of its efficient delivery service. Albany Felts *always* arrive when wanted. As a result, not a single paper machine depending on Albany ever had to shut down. In safe, rugged shipping cartons (or packaged to your specifications)—Albany Felts *always* arrive when you want them to arrive. It's just another feature of *Albany's First Class service.*

Engineering Service
Laboratory Service
Research Service
} *Available to You Without Cost!*

Talk it over with your Albany Felt Sales Engineer

AF

ALBANY FELT COMPANY
ALBANY, N. Y.
World's Largest Manufacturers of Paper Machine Felts

Allied News Notes

Pennsalt Chemicals Corp. will probably begin building its long-planned, $10 million operation at Squamish, (just north of Vancouver) in the near future. This plant will supply chemicals to the pulp and paper industry in British Columbia. By the end of this year, Pennsalt will also complete the first phase of a $6 million modernization program of its Wyandotte, Mich., chlorine-caustic soda facilities before the end of this year. The first section of improvements include new 50 per cent caustic soda evaporating facilities designed to reduce costs and improve quality. The second major phase, to be finished in mid-1960, will be the replacement of several thousand Gibbs diaphragm-type electrolytic cells.

Morden Machines Co. of Portland, Ore., has completed a new addition that has enlarged office space by 30 per cent. The added offices will be used primarily for expanding the administrative, engineering and sales departments. Research and laboratory facilities were also enlarged to further the company's testing and development program.

Valley Iron Works Co. of Appleton, Wis., will now be known as the **Valley Iron Works Corp.,** a wholly-owned subsidiary of the **Allis-Chalmers Mfg. Co.** The subsidiary will continue to operate under the present management and its functions will be carried on by the existing organization.

Dow Chemical Co. has announced the formation of a new division to be known as the Industrial Service Division. This division will handle industrial chemical services. It will take over solvent cleaning functions performed by the company's Dowell Division and will also provide services and products in the municipal and industrial waste and water treatment areas. John G. Staudt has been named president and John S. Spriggs as vice president and general manager of the new division. Dow has also announced plans to construct a new plant to manufacture styrene-butadiene latexes at Allyn's Point, Conn. This plant will become a part of Dow's Allyn's Point Division which manufactures two other major Dow Plastics, Styrofoam and Styron. The Texas Division at Freeport is also on the list for expansion of its styrene-butadiene latex capacity.

Hercules Powder Co. has dedicated its U. S. Patent No. 2,478,379 to the free use by anyone. This patent relates to the process of inhibiting cellulose degradation during chlorine bleaching in an aqueous acidic medium in the presence of free chlorine and a small amount of nitrogen-containing compound, such as ammonia and amines, as the inhibitor.

Black-Clawson Co. has begun construction of a new research laboratory in Middletown, Ohio. This laboratory will be equipped to investigate every aspect of paper stock preparation and other papermaking operations. Space is being provided for expansion on these facilities and extension of them into related pulping and papermaking operations.

Merrick Scale Mfg. Co. has opened its factory representation at 400 West Madison St., Chicago. This office is under the direction of J. A. Marx. Marx has more than 10 years experience in the sales and servicing of the Merrick line.

Adhesives . . .
(Continued from page 641)

styrene-butadiene particles in the emulsion, and other variables that have a distinct effect on the properties of both latex and coated paper.

Styrene-butadiene is recommended for both machine and conversion type of coating operations where high quality printing papers are required. The use of styrene-butadiene latex in machine coatings has become well established because it has been found to improve the rheological properties of the formulation, ease finishing problems and result in finished paper with superior printing properties. The coated paper containing latex has improved fold, gloss, bonding of the coating to the paper and less tendency to curl.

The use of latex permits the formulation of coatings having a higher solids content without a resultant increase in viscosity, permitting high speed operations at relatively high coating weights.

Off-machine or conversion coating is usually employed where an especially high grade of coating is required. In such applications, where quality is essential, the use of latex is ideally suited and results in coatings with superior smoothness, gloss, fold, varnishability and uniformity of ink receptivity.

The use of small amounts of latex, such as 5 to 10 per cent of the adhesive system, will aid in the flow of properties of the formulation, improving the rheological characteristics and results in a coated paper having a higher degree of smoothness.

The required properties of some coated paperboard has necessitated the use of high quantities of latex in the formulation. Many coaters, particularly the trailing blade operators, are now using latex in quantities as high as 90 per cent of the adhesive systems where it is necessary to obtain high water resistance, gloss and ink holdout. In boxboard coatings and waxing tissue for bread wrappers, latex coatings are now commonly used in which latex constitutes 100 per cent of the adhesive system.

Coming Events

TAPPI

February 22-25 — 45 Annual Meeting, Hotel Commodore, New York, N. Y.
May 23-25 — 11th Annual Coating Conference Edgewater Beach Hotel, Chicago, Ill.

PIMA

January 14 — Connecticut Valley Division Publick House, Sturbridge, Mass.
January 21 — Michigan Division (Joint meeting with Kalamazoo Valley section of TAPPI) Hotel Harris, Kalamazoo, Mich.
February 18 — Michigan Division, Hotel Harris, Kalamazoo, Mich.
April 23 — Michigan Division, Hotel Harris, Kalamazoo, Mich.

OTHER MEETINGS

January 21 — 4th Annual Pulp and Paper Conference, Western Michigan University
January 25-28 — Plant Maintenance & Engineering Show, Convention Hall, Philadelphia, Penn.
January 26-29 — Annual Meeting, Technical Section CPPA, Queen Elizabeth, Montreal.
February 1-4 — Instrument Society of America Conference, Rice Hotel, Houston, Texas.
February 15-17 — 1960 Forest Management Control Conference, Purdue Memorial Center, West Lafayette, Ind.
February 22-25 — 83rd APPA Annual Meeting, Waldorf-Astoria, New York
March 22-23 — Folding Paper Box Association of America, Annual Meeting, Ambassador Hotel, Los Angeles
April 6-7 — Ninth Annual Forestry Symposium, Louisiana State University.

Current Comments . . .

(Continued from page 645)

Oxford Paper Co.—Net income for nine months, $1,655,965; a year ago, $1,817,525.

Paterson Parchment Paper Co.—Net income for nine months, $418,995; a year ago, $342,802.

Puget Sound Pulp & Timber Co.—Net income for nine months, $3,356,771; a year ago, $2,132,811.

Riegel Paper Corp.—Net income for nine months, $2,496,663; a year ago, $2,055,906.

Sealright-Oswego Falls Corp.—Net income for nine months, $1,810,677; a year ago, $1,665,264.

Standard Packaging Corp.—Net income for 40 weeks, $5,108,113; a year ago, $2,149,270.

St. Regis Paper Co.—Net income for nine months, $19,772,667; a year ago, $13,195,053.

Stock and Bond Quotation

New York Stock Exchange — Stocks

Closing Prices	Nov. 10, 1959	Oct. 9, 1959
American Can	41⅝	43⅞
Same pref.	* 37-37½	36⅞
Celotex	34⅛	34¼
Same pref.	* 18¼-18½	* 18-18¼
Certain-Teed	15¾	13⅓
Champion P & C	40½	43
Same pref.	* 88½-89⅛	88⅜
Chesapeake of Va.	35¼	* 38⅝-41⅛
Container	26⅜	29⅞
Same pref.	* 82-85¼	* 82-83
Continental Can	40⅞	48¾
Same pref.	79	78¾
Crown Zellerbach	54¼	56⅞
Same pref.	88¾	88¼
Same pref.	30	28¾
Diamond National	38⅞	32¼
Federal Paperboard	46¾	49
Same pref.	* 21¾-22	* 21⅝-22
Fibre Paperboard	51¾	52¼
Great Northern	51¾	52½
Hammermill	32½	32¼
International	134	128½
Same pref.	88	* 88¼-89
Kimberly-Clark	66¼	65
McAndrews & Forves	* 30-30½	31¼
Mead Corp.	49	45⅜
Same pref.	* 86½-88½	* 87½-88½
Minnesota & Ontario	32⅜	33
Oxford Paper	28⅝	33
Same pref.	90	93
Rayonier	23⅜	24½
Riegel Paper	39½	39¾
St. Regis	52⅛	52⅜
Same Pref.	* 91¾-96½	* 91-97
Scott Paper	81	81¼
Same $4 Pref.	84½	* 87⅛-89½
Same $3.40 Pref.	76	* 76-79½
Sealright	38	38¼
Standard Packaging	32¼	33¼
Same $1.60 Pref.	* 93-100	* 95-100
Same $1.20 Pref.	36⅞	36¾
Sutherland Paper	33½	36¾
Union Bag-Camp	44¼	45
United Bd & Carton	29	33½
United Wallpaper	—	8⅛
Same Pref.	—	16
U. S. Gypsum	98½	97⅜
Same Pref.	*153-155	*145½-155
West Va. P & P	53¼	48¼
Same Pref.	* 94½-96¼	* 96½-99

New York Stock Exchange — Bonds

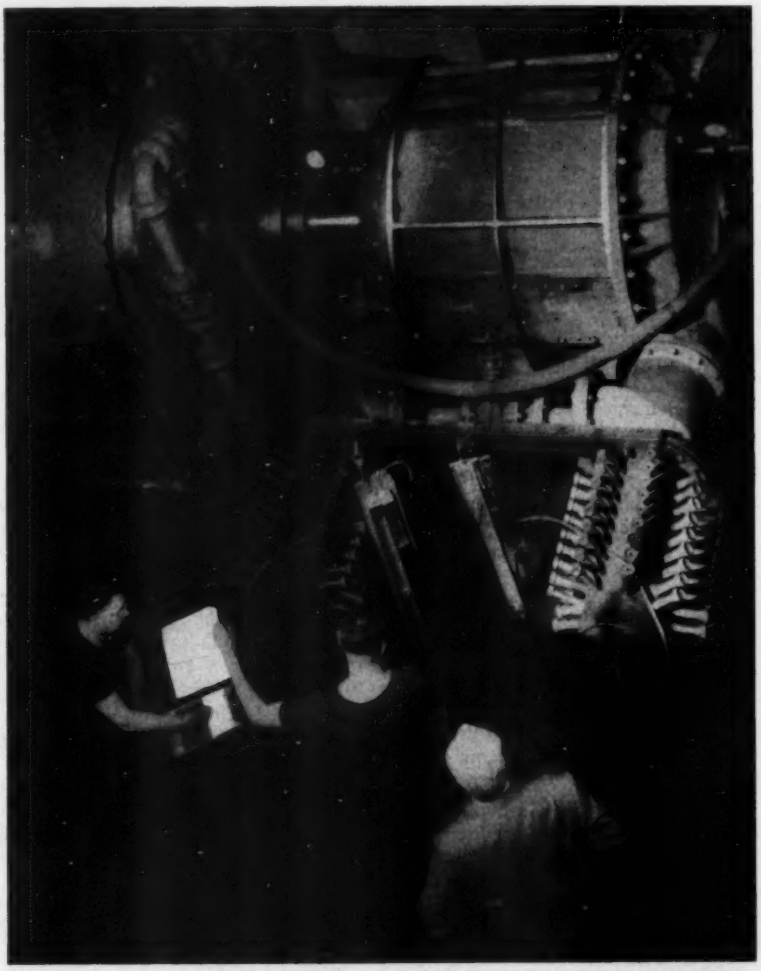
Champion P & F 4¾%	112½	110
Champion P & F 3¼%	92½	93½
Diamond Gardner 3%	—	—
Kimberly-Clark 3%	89	86½
Mead Corp 3%	—	—
Oxford 4¾%	107½	111
Scott 3%	105	104¾

American Stock Exchange — Stocks

Allied Paper	11⅜	11¾
American Writing	32⅞	32
Brown Co.	10¾	12⅜
Puget Sound	27⅜	24⅛

*Closing Bid and Asked Prices.

Rated performance of every Nash Vacuum Pump is assured by this precise laboratory test



Rated capacities of Nash Vacuum Pumps are not theoretical. Every Nash Pump is tested individually. Air capacity is determined by delivery thru accurately machined and calibrated orifices. Related vacuum is measured by precise mercury column, and horse power is recorded electro-dynamically. Records of these tests are retained by us, and certified copies are available to Nash Pump owners.

That is one of the reasons why Nash Vacuum Pumps are installed in over a thousand leading Paper Mills. An engineer from Nash will be glad to survey your mill, and make recommendations, entirely without obligation to you.

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NAMES in the NEWS

Louis E. Wise to Receive 1960 TAPPI Medal

Dr. Louis E. Wise, senior research associate at the Institute of Paper Chemistry, has been unanimously selected as the recipient of the 1960 TAPPI Medal Award.

Dr. Wise is well-known for his many educational contributions to the pulp and paper industry. He has published more than 127 papers and books on the subjects of wood chemistry, cellulose, hemicelluloses and carbohydrates. His widely used monographs on "Wood Chemistry" have given him world-wide reputation. The first edition was published with the late L. F. Hawley of the Forest Products Laboratory in Madison in 1926. This was completely rewritten as a new monograph with 14 other authors. The second edition of the new monograph, edited with E. C. Jahn, appeared in 1952.

His formal education was obtained at Columbia University. He received his Ph.D. degree in 1911.

After a brief employment with Standard Varnish Works on Staten Island, Dr. Wise returned to Columbia University as an instructor in biochemistry until 1913. After leaving Columbia, Dr. Wise has served as: instructor in chemistry at the University of Missouri; biochemist at the Bureau of Chemistry, for the United States Department of Agriculture; and Professor of Forest Chemistry and head of the Department of Forest Chemistry at the New York State College of Forestry at Syracuse.

Dr. Louis E. Wise

Professor Wise was instrumental in activating the Department of Pulp and Paper Making at the New York State College of Forestry together with Clarence E. Libby.

In 1941, Dr. Wise joined the Institute of Paper Chemistry in Appleton, Wis., as research associate and in 1957 was made senior research associate. He is a member of TAPPI, The Amersin Chemical Society and the Wisconsin Academy of Science, Arts and Letters.

The presentation of this Award will be made at the 45th Annual TAPPI Meeting to be held in New York on February 22-25, 1959.

Brown Co.

Laurence F. Whittemore, chairman of the board, has announced his resumption of the company's affairs, pending the selection of a new president.

A. E. H. Fair, resigning president, stated that he "presently has certain obligations" and intends to "extend further my consulting work in the paper industry with Brown and other companies".

Reorganization of the company's top management personnel has been initiated as follows: Stuart W. Skowbo will continue as senior vice president and treasurer; Edward H. Petrick will become vice president and general manager, paper division; Hugh D. Jordan becomes general manager of the sulfite pulp division; Malcolm T. Murray will become staff vice president in general charge of coordinating sales of various company divisions; John W. Jordan will continue as vice president, general counsel and company secretary; C. S. Herr, vice president in charge of woods operations, will additionally assume general management of the company's saw mills; Conrad T. Waldie becomes general manager of towel manufacture, conversion and sales, Dr. Paul M. Goodloe will continue as director of research and development; George Craig will continue as chief engineer; Roland E. Fickett becomes Berlin assistant to the board chairman.

Hurlbut Paper Co.

William A. Hosmer has been named superintendent of the Willow Mill of Hurlbut Paper Co., South Lee, Mass. Hurlbut Paper Co. is a subsidiary of Mead Corp. Prior to his new position, Hosmer served as assistant to the general superintendent and assistant superintendent of the Willow Mill.

It was also announced that Richard E. Sitzer and George S. Serra have been elected comptroller and assistant comptroller, respectively, for Hurlbut Paper Co. Sitzer will also retain his responsibilities as treasurer and member of the board. Serra will also continue his activities as production planning and scheduling head in addition to his new duties.

Sutherland Paper Co.

William Race, who has served Sutherland as chairman of the board since last December has now resigned. The resignation of Martin Galbraith has also been announced. Galbraith has been vice president and technical director.

Kimberly-Clark Corp.

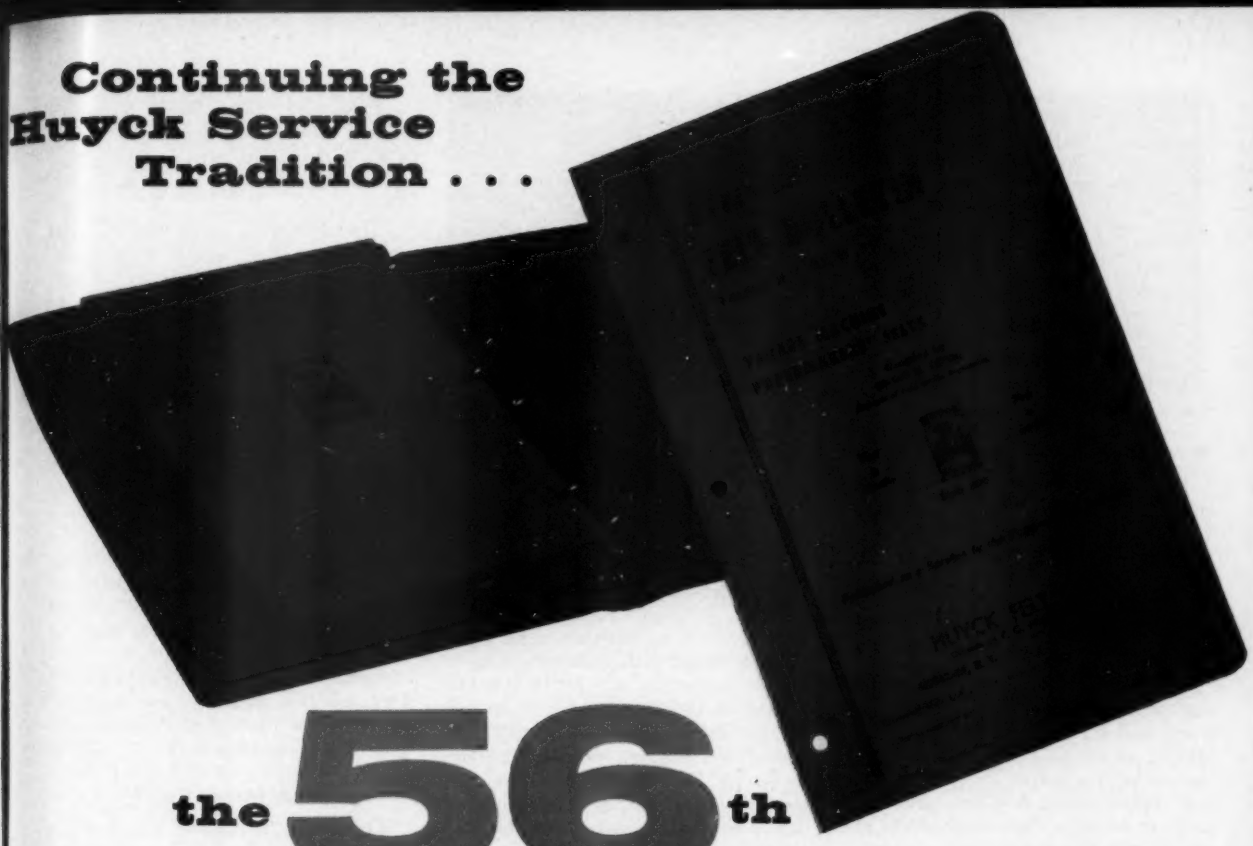
William R. Kellett has been elected to serve as president of Kimberly-Clark Corp. He will succeed John R. Kimberly who has served this position since 1953.

G. Kenneth Crowell has been appointed to serve in Kellett's former post as executive vice president of the corporation. Crowell was previously vice president and secretary.

Dr. James Clark

Dr. James d'A. Clark has been appointed professor of pulp and paper science at Oregon State college, Corvallis. He will be concerned mainly with graduate and post-graduate work on fundamental pulp and paper problems and hopes to attract more students to the industry with its help in establishing additional fellowships.

Continuing the Huyck Service Tradition . . .



the 56th

. . . in Huyck's series of FELT BULLETINS . . . the most complete, most concise reference library on the application of Papermakers' Felts

In addition to conducting Felt Workshops and Forums to supply general felt application information, Huyck has published for many years a series of detailed Felt Bulletins that keeps papermakers posted on "what's new" in the use and care of felts. This latest bulletin, the 56th in the series, presents questions and answers concerning practical problems connected with **Yankee Machine Papermakers' Felts** and continues the Huyck Service Tradition of providing operating information of current interest for better felt performance.

HUYCK FELTS

Huyck Felt Co.,
Rensselaer, N. Y.;
Aliceville, Ala.;
Division of F. C. Huyck & Sons
In Canada: Kenwood Mills Ltd.,
Arnprior, Ontario.

NEW **HUYCK FELTS** ★ INDUSTRIAL FABRICS

FIRST IN QUALITY • FIRST IN SERVICE SINCE 1870

Names in the News . . .

Clark will, however, continue his consulting work, especially in the fields of pulp and stock preparation, air deposition of fibers and structural boards from wood. A large new mill for his wafer-board process is presently being engineered for a central location in Saskatchewan, to start up next year.

Mead Corp.

Lloyd W. Hale, assistant comptroller has been transferred to Dayton, Ohio, from Mead Corp.'s subsidiary — Chillicothe Paper Co. Added to the Dayton staff is Paul E. Murray and Thomas J. Bresnahan.

Weyerhaeuser Timber Co.

Erskine C. Ingram has been named manager of Weyerhaeuser Co.'s paperboard mill at Delair, N. J. He has been serving as assistant superintendent of the company's Everett sulfite mill. He will replace Stuart B. Clark, who will retire as manager and vice president of the former Kieckhefer-Eddy division.

Berthold M. Fischer, who recently was appointed general traffic manager of paperboard converting operations, will cover the company's shipping container, milk carton and folding carton divisions, with headquarters in Chicago.

West Virginia Pulp & Paper Co.

With the consolidation of the company's kraft paper and containerboard sales groups into a unified organization, Robert S. Kettrick, formerly manager of containerboard sales, will head the new organization which will be designated as kraft division sales.

Alfred S. Nalle has been made special assistant to Wiley L. Jennings, vice president, sales.

In the two districts created by the new kraft division sales organization, John M. McClure, has been made eastern district manager with headquarters in New York. Donald J. Beardsley will be manager of the midwestern district headquartered in Chicago.

Thomas A. Duncan has been appointed district sales manager in Baltimore for corrugated products, Hinde & Dauch Div. He will service the southeast area headquartered in Atlanta, Ga. Duncan succeeds Arthur N. Turner Jr., who has been assigned to a newly created sales position with the Hinde & Dauch Div.

Previously with West Virginia's central engineering department, Louis Dela Grange has been appointed regional engineer for Hinde & Dauch Div.

The following appointments and assignments of personnel were recently announced at the H&D central testing laboratory: Edmund W. Carney to the newly created position of development engineer; Joseph P. Guerra will assist Carney as junior development engineer; Foster Ewing has been assigned to the quality control department as a technical service engineer for manufacturing; Russel C. Nagel, formerly head technician at the testing laboratory, has been appointed foreman.

Howard E. Kincer has been promoted to the position of superintendent of the lower paper mill at the Luke mill of West Virginia Pulp & Paper.

Ronald C. Jezerc has been promoted from assistant superintendent to superintendent of the technical service department at the Luke mill.

Morgan Adhesives Co.

Dr. Albert J. Klemka was recently appointed as technical director of the Morgan Adhesives Co., a subsidiary of Bemis Bro. Bag Co. Klemka, for-

HANCHETT TRAVELLING WHEEL TYPE KNIFE GRINDER

MODEL AK AUTOMATIC

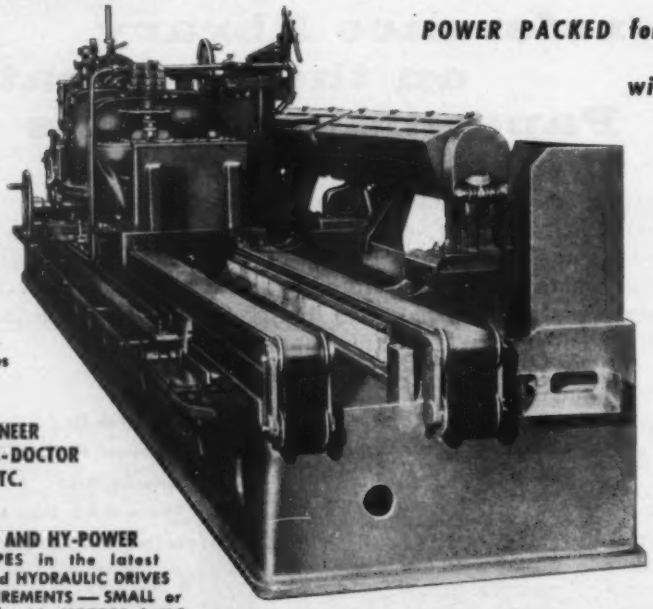
EXTRA HEAVY DUTY

SPECIFICATIONS

Capacity—84" to 396" lengths; Motors — 7½ to 40 H.P., Balanced; Drives — Mechanical - Hydraulic; Speeds—10' to 150 ft. per min.; Wheels—16"-20"-24" Dia.; Types — Cylinder - Segmental; Bearings — 100% Ball and Roller Types

FOR CHIPPER-HOG-PAPER-VENEER KNIVES-ROTARY CUTTERS-DOCTOR BLADES-SHEAR BLADES-ETC.

OTHER MODELS - DN - GK AND HY-POWER TRAVELLING TABLE TYPES in the latest MECHANICAL-ELECTRIC and HYDRAULIC DRIVES to meet ALL KNIFE REQUIREMENTS — SMALL or LARGE from 32" to 240" with MOTORS 3 H.P. up to 75 H.P.



Built by Master Craftsmen

POWER PACKED for HIGH PRODUCTION with PRECISION ACCURACY

SMOOTH RUNNING
QUIET
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WE GUARANTEE

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HANCHETT MANUFACTURING COMPANY

Main Plant BIG RAPIDS, MICH.
West Coast PORTLAND (1) OREGON

merly with Behr-Manning Co., will direct all research and development of Morgan Adhesives' advanced pressure-sensitive adhesive printstock for use by the graphic arts industry.

Gordon G. McMahon was named regional sales manager. He will serve as Midwest regional sales manager.

Continental Can Co.

Five appointments in the Paper Container Division of Continental Can Co. has been announced by the general manager of sales, M. C. Alex.

S. R. Panter has been named sales manager of the eastern region. Panter was previously district sales manager in the middle Atlantic states.

W. J. Simons, previously manager of sales and product administration, has been appointed sales manager of the central region.

R. J. Norman will now assume position as manager of sales and price administration with headquarters in Newark, N. J.

T. P. McGlynn has been named manager of market and new product development. He was previously manager of market development.

M. W. Ashby has been appointed manager of plastic bottle sales in Montclair, N. J. He was formerly district sales manager in Dallas, Texas.

Jerry V. Dixon has joined the division as sales representative operating out of Dallas, Texas.

Allied Personalities

William J. (Bill) Shaughnessy has joined the A. E. Staley Mfg. Co. as a paper technical representative in the New York state territory.

The appointment of **Leonard J. Wood** as product manager of the Paper Division has been announced by National Starch & Chemical Corp. He was formerly manager of paper development and service.

Cameron Machine Co., has announced two changes in sales territorial coverage. **Richard Sherman,** who served as representative in New York, will now also cover New Jersey and Connecticut. **W. R. Ebersold** will represent the company for the middle Atlantic states, including Pennsylvania, Maryland, Delaware, West Virginia and Virginia.

Patton Mfg. Co. has appointed **William Lang** as sales engineer and **Geoffrey Jowett** as project Engineer. Lang will function in a sales engineering and customer consulting capacity in Patton's Paper Mill Machinery Division. Jowett will also function exclusively in the same division.

Felt industry veterans—Talking over their early days in the Paper Industry are four of the five retired Albany Felt Co. veterans who have totalled no less than 154 years of service. Honored at "Old-Timer's Night", which climaxed a recent two-day sales meeting, are left to right, Harry Stilwell, George Fitch, Elmer "Mac" MacLaren and Niels Juels-Larsen. Absent was J. Petteys.

George Lamb, president of Lamb-Grays Harbor Co. Inc., has been elected to a two-year term as chairman of the advisory board of the institute of technology at Washington State University.

Albert B. Connelly has accepted his new position as manager of the Birmingham, Ala., sales office of Allied Chemical's General Chemical Division. He will succeed **John T. Wiegand,** who has been named manager of the Los Angeles, Calif., office.

Harry Moore, president of Beloit Iron Works, has announced that **Lloyd Hornbostel's** health has improved to the point that he will return to an active business life with Beloit. Moore stated that Lloyd will serve as technical assistant to the president.

Frederic A. Soderberg, vice president of F. C. Huyck & Sons, has

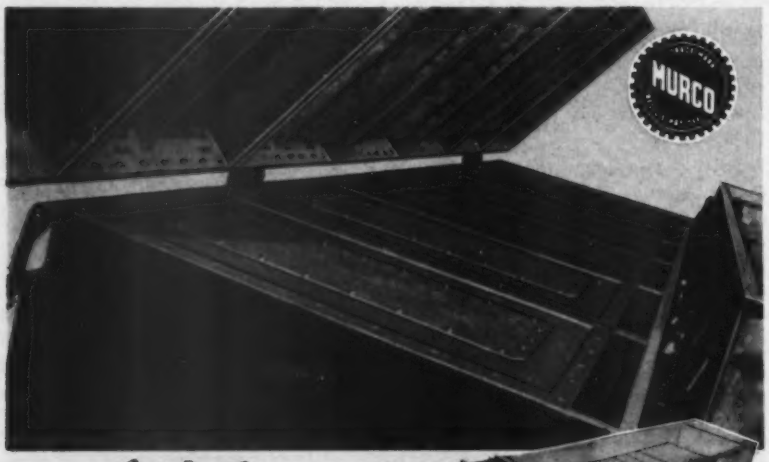
been appointed General manager of the Huyck Felt Co. Division.

James L. McAndie has become sales engineer for the West Coast territory for Morden Machines Co. **Frank E. Caskey,** who previously held this post, is now manager of Technical Sales and Services.

Thomas L. Stirling has been elected vice president of the Paper Department for Perkins-Goodwin Co.

Thomas A. Jones has been named president of Manchester Machine Co. **James Boyd,** who has been president of Manchester, has retired but will continue to serve as a consultant to the company.

The following appointments for regional sales managers and additional sales representatives has been announced by P. H. Glatfelter Co: **Nelson P. Arigo** has been appointed as sales manager of the Central Region, working out of the home office in Spring Grove, Penn.; **John C. Hildebrand** is now sales manager of the Atlantic Region with headquarters in New York City; T. M. **Glatfelter** is manager of Book publishing sales; **Kenneth R. Orff** has been assigned to sales staff of the Atlantic Region and will cover New England, New York and the South Atlantic States; and **Harry A. Dreyer** will represent the company in the Atlantic Region covering Metropolitan New York, New York State, Maryland and Washington, D.C.



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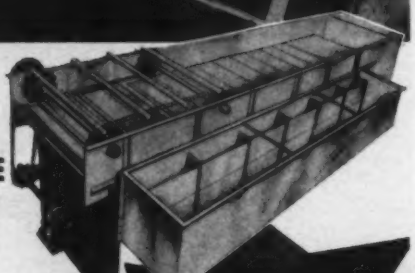

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Necrology . . .

Cecil McCie Matheson

Cecil Matheson has been a director and also general sales manager of pulp and paperboard for Fraser Companies Ltd. He joined Fraser at Edmundston, N. B., in 1919. In 1949 he became general sales manager of pulp and paperboard and was elected to the board in 1952.

Dr. William H. Schuette

Dr. William H. Schuette was serving as vice president of the Dow Chemical Co. and general manager of the company's Midland Division. He began his Dow career in the chemical engineering laboratory at Midland in 1941.

J. Raymond Levis

J. Raymond Levis, before his death, served as president of John A. Levis & Sons Inc. He entered the paper box manufacturing business with his father, the late John Levis, and his brother, Gay R. Levis.

Dr. L. Waldbauer

Dr. Louis J. Waldbauer was supervisor of the analytical research and technical information section at the General Aniline & Film Plant in Rensselaer. He was also associated with E. I. duPont de Nemours & Co. as a research chemist.

Henning W. Prentis Jr.

Henning W. Prentis Jr., a nationally known industrial and civic leader, had been serving as chairman of the board of Armstrong Cork Co. since 1950.

Prentis joined Armstrong in 1907 as assistant to the manager of the Insulation Division. Four years later he became the first manager of the company's first Advertising department. He was elected a vice-president of the company and a member of the board of directors in 1926. In 1934 he was elected president and retired in that position in 1950 to serve as chairman of the board.

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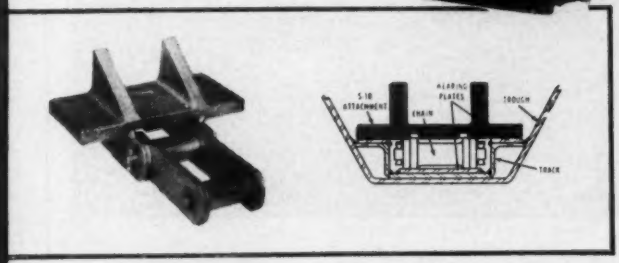

SHOCK ABSORBER. S-10 attachment for SS-150+ chain has broad sliding surfaces that contribute to long wear-life of both track and chain. Impacts are absorbed by track, not chain joint.

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FOREIGN ABSTRACTS

Pulp and paper mill to use "atomic" steam

A Norwegian pulp and paper mill in Saugbrugsforenigen at Halden, apparently will be the first in the world to use steam generated in a nuclear power plant. The latter is being built and will be operated by the Norwegian Atomic Energy Institute.

K. R. Svendsen. *Pulp and Paper International* **1**, No. 3, 51 to 52 (1959) through *Abstr. Bull. Inst. Paper Chem.* **30**, 41 (1959).

Dynamic strength testing of heated papers

A new tester was devised in the laboratory of the Niederrheinische Papier u. Pappenfabrik A.G. in Neuss, Germany. The apparatus is shown in Fig I.

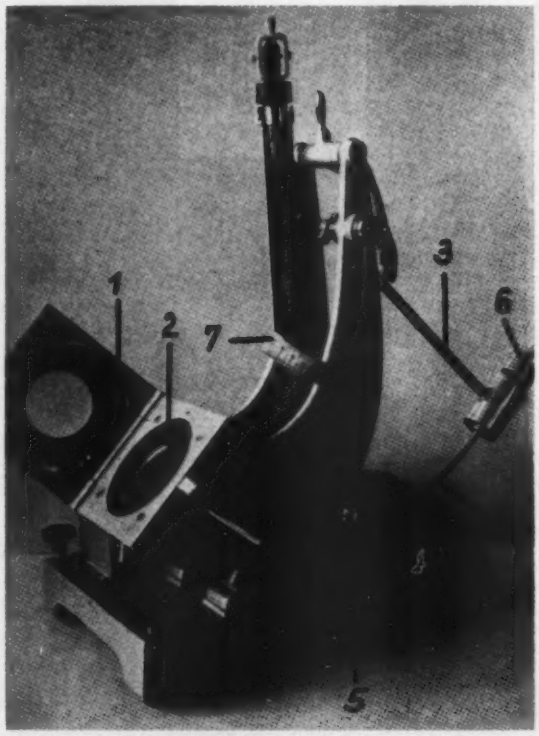

Fig. I

The sheet to be tested is clamped by means of (1) and rests against the ring (2). The latter can be heated by means of radially inserted jets conveying hot air. To a hammer-like pendulum (3) is attached a metal arc (4) carrying, at one end, a metal ball (5) and at the other a suitable counterweight (6) so that when at rest, the test sheet is just tangent to (5). Prior to the test, (3) is raised to a 45° angle and after its unhampered swing, it again reaches a 45° angle. When (3) is released, (5) strikes the sheet with a maximum speed of 125 cm. per 0.1 sec. and carries a kinetic energy of 51 cm. kg. The scale (7) records the work in cm. kg. required to rupture the sheet. The tests carried out with various types of paper (especially bag paper) were usually made at 20 and 80°C. but at times also at 130°. Calculations are given for determining the dynamic resistance of the sheets.

This new method is compared with other methods of testing such as breaking length, tear, elongation, etc. The relationship between pre-drying temperatures and resistance to rupture was also determined and appropriate graphs and tables are given.

Toni Eich. *Das Papier* **13**, 301 to 305 (in German).

Groundwood and chemigroundwood pulps from New Guinea woods

The production and properties of groundwood and chemigroundwood pulps from *Araucaria* thinnings and from two species of a mangrove association (i.e. *Excoecaria agallocha* and *Camptostemon schulzii*) were studied. Those from *Araucaria* were weaker and more highly colored than pulps produced under similar conditions from Swedish spruce and *Pinus radiata*. *E. agallocha* groundwood gave a better pulp than that from *C. schulzii* and could serve for producing mechanical pulp.

Both neutral sulfite and caustic soda pretreatments of these woods gave chemigroundwood pulps that were stronger than those formed by the usual groundwood process. In the case of *Araucaria*, the neutral sulfite pre-treatment was better than that with caustic soda and gave a pulp whose strength properties compared with those of commercial mechanical pulps. In the case of the mangrove woods, the pulp of highest strength was obtained by treating *E. agallocha* with sodium hydroxide before grinding but the low bulk and extended drainage time of this pulp would militate against its ready acceptance for commercial use.

Five tables and seven references are given. F. H. Phillips and H. J. Watson. Progress Report No. 6 on *Pulping Properties of Tropical Timbers*, Division of Forest Products, C.S.I.R.O., South Melbourne, Australia, (1959) (abstracted for scientific purposes only).

Drying effluents from a sulfite alcohol plant

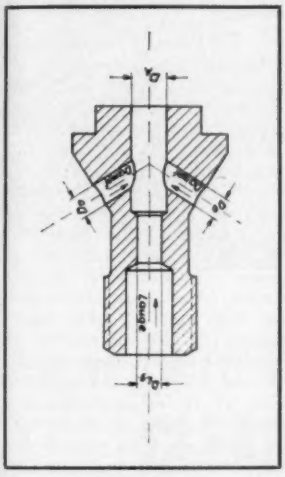

Fig. 2

The author describes, in some detail, a part of the work done for his dissertation at the Technische Hochschule in Munich. Sulfite spent liquor was fermented, freed from alcohol and evaporated to about 50 per cent solids. It was then spray-dried in a pilot plant using the Kuhles' system, and the effluent was converted into a combustible powder at the rate of 1.5 tons of effluent per hour.

The powder, which had a low moisture content, was obtained by using waste gases from the boiler room having an intake temperature of about 300° C., and obtaining a requisite spray fineness by using steam jet injectors and a spent liquor intake as shown in the figure (Dampf = steam; Lauge = liquor). The droplets in the spray never exceeded 280 microns and were often kept below 140 microns. Thermodynamic data of a series of such spray dryings are given. A typical calculation is also included. Heat consumption data were used in calculating the efficiency in both converting the concentrated spent liquor into powdered fuel and that of the entire plant, *i.e.* initial evaporation of the liquor, spray drying and combustion of the sulfite powder.

Fifteen references, five tables and 14 figures are included. Hans-Wolfgang Schippel. *Das Papier* 13, 416 to 428 (1959) (in German, English and French summaries).

Parenchymatous- and "tracheidal-ray" cells of Scots pine

In a series of extensive studies on the resins in parenchymatous cells and in resin canals of the conifers, the authors also studied the characteristics of the cells of Scots pine grown in Northern latitudes. The need for basic data was stressed previously, since these have a bearing on pulping, and the characteristics and role of ray cells in the papermaking operation were also alluded to.

Two main types of parenchyma cells occur in the uniserate rays of Scots pine. Of the ray cells studied, about 85 per cent were those with a secondary cell wall thickening within the non-pit area. The other type however are uniformly thin-walled, and since they lack characteristic features, they have usually been neg-

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lected and have even escaped recognition. In any fiber or pulp suspension, they cannot be fully differentiated from vertical parenchyma cells.

The overall relative proportion of the thin-walled, primary area of the parenchyma rays cells is estimated as about 50 per cent, which is an extremely high value. This appears to be one of the reasons that pinewood pulp so readily permits the chemical removal of resinous materials. Vertical parenchyma cells are also thin-walled and occur in connection with the resin canals which they surround. Their relative amount is about 20 per cent of all parenchyma tissues, not including epithelial or pith cells. "Tracheidal" ray cells are not only characterized by bordered pits but also by the pattern of cell wall thickenings at tangential and horizontal-radial walls. Their frequency to that of parenchymatous ray cells is about in the ratio of 2.8 to 1.

Fourteen excellent photomicrographs are included, only one of which is shown in Fig. 3. This shows undefibrated pine pulp with

Fig. 3

adherent ray, containing "tracheidal" ray cells as well as parenchymatous ray cells of both types. Arrows indicate the uniformly thin-walled ray cells mentioned above.

Vera Nyrén and Ernst Back. *Norsk Skogind* 13, 267 to 278 (1959) (in English).

Prebleaching of sulfite pulps

This study had as its object, the elucidation of the influence of the prebleaching stages on the properties of the final bleached pulp. The data indicate that the temperature of the initial chlorination stage has a marked influence on the consumption of the chlorine.

Starting with a sulfite pulp having a Roe number of 5, the reaction rate increased almost twenty-fold when the temperature was raised from 2° to 50°. At temperatures approaching the freezing point of water, it was impossible, within practical time limits, to take up the amount of chlorine normally consumed at higher temperatures of bleaching (Cf. Diag. 1). In the prebleaching operation (for a given amount of chlorine) the chlorination temperature did not affect the actual pulp properties (at least for paper grade pulps).

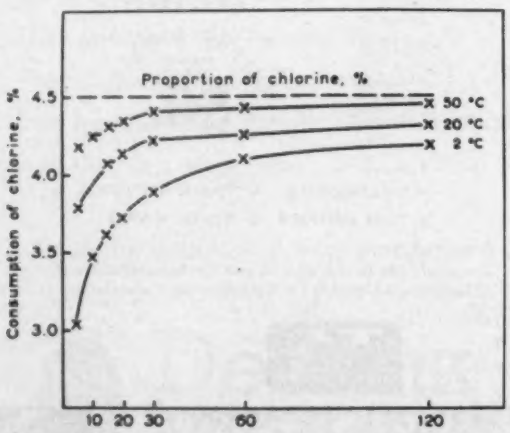

Diagram 1.

Consumption of chlorine in the chlorination of sulphite pulp at various temperatures

A second chlorination stage in the prebleaching operation only caused a one-unit improvement in G. E. brightness. When a neutralization stage was introduced between the two chlorinations, about one more point was achieved; however, the final yield of totally bleached pulp was 2 per cent higher when only one chlorination was used than when two were introduced.

Subsequent to chlorination and neutralization, conditions of the alkaline-extraction stage had relatively little effect on the pulp properties. However, an intensification of the alkaline extraction reduced the tendency towards reversion; it improved the resistance to tear, but it also caused a decrease in breaking length and bursting strength.

The usual bleaching stages in this study involved chlorination, using a pulp consistency of 3 per cent and a reaction time which (as indicated in Diag. 1) was extended to various periods up to two (hours). Neutralization was carried out with dilute sodium hydroxide at 20°. This was followed successively (unless an additional chlorination was used) by alkaline extraction at 50° for one hour, hypochlorite bleaching at 40° pH over 9.5 for three hours and final acidification to a pH below 5.5 with sulfur dioxide for 15 min. at 20°.

Fourteen references, five tables and three diagrams are given. N. E. Virkola, Y. Hentola, M. Makinen and R. Soila. *Svensk Papperstidn.* 62, 477-83 (1959) (in English).

Air content of stock solutions

After making a critical survey of the literature dealing with various techniques used in determining the air content of pulp suspensions and the devices used for deaerating such mixtures, the authors conclude that the Boadway volumetric method is the most useful one for gaging the air content of the suspensions. [cf. *Pulp & Paper Mag. Canada,* 57, *Convention No.,* 185 (1956)].

When the stock in several headboxes was analyzed, appreciable differences in air content were found. These differences were ascribed mainly to the air content of the water used in diluting the stock. The "tendency to absorb air" is defined in terms of the amount of air contained in a pulp suspension after a specific mechanical aeration process has been used. Experimental evidence showed that surface active agents favor the formation of air bubbles and that these have a marked effect on the air content of the suspension. The high air content of mechanical pulp may be due to the presence of these agents.

The authors determined the air at various stages of the papermaking operation; they also used a variety of pulps. For example, a straw pulp suspension contained only 0.1 per cent air when it reached the machine wire, whereas a stock used in the manufacture of toilet paper retained over four per cent air. Other stocks showed intermediate values. Air uptake could be reduced by various antifoaming agents and by the use of Deculators (either with or without Bauer cleaners) or Vorvacs. When the air content of the pulp suspensions was high, their drainage rates were reduced greatly; the pulp strength, smoothness and strength of dried sheets also suffered. On the other hand, the porosity of the paper sheets increased. This work emanated from the Technische Hochschule at Darmstadt and the laboratories of the Feldmühle Papier u. Zellstoffwerke, A. G.

Sixteen references. Walter Brecht and Ulrich Kirchner, *Wochbl. Papierfabrik.* 87, 295 to 305 (1959) (in German).

Uses of an instrument for measuring printability

This apparatus which is not described fully here, was evidently reported on by Dr. E. Rupp, at the Turin, Italy, meeting of European TAPPI, on September 15, 1959. The instrument was developed at the Institute of Graphic Technology in Leipsic, and the present paper describes very briefly its uses in testing the properties of six papers used in the graphic arts.

In the development of the apparatus, the following criteria were considered: the transfer of color (i.e. ink); the covering power of the color; strike-through; resistance to "picking"; tolerance to compressive stress; and the drying of the ink. The first four of these appear of special interest to the paper industry in gaging the printability of various papers.

F. Wultsch and K. Schubert. *Wochbl. Papierfabrik.* 87, 739 to 41 (1959) (in German).

Smears of size on glass show clarity of Ten-O-Film, right, almost invisible, compared with conventional starch, left.

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PATENT REVIEWS

MELVIN NORD*

Method and apparatus for making paper

U. S. 2,890,149, issued June 9, 1959, to Wilhelm H. Muller and assigned to J. M. Voith G.m.b.H. Maschinenfabrik, describes a papermaking machine having an inclined wire screen which makes it possible to combine the advantages of the fourdrinier and the cylinder machines. The apparatus is shown in Figs. 1 and 2.

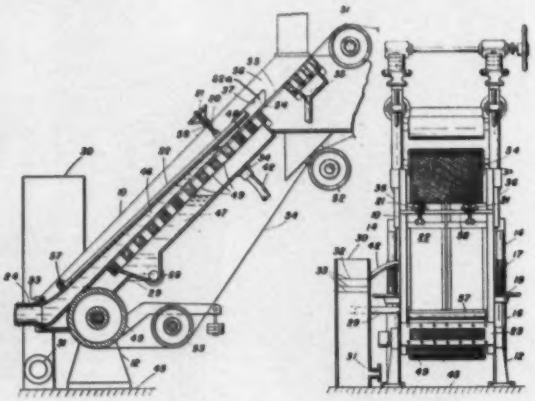

Fig. 2

Fig. 1

The formation of a screen or track of paper is carried out on a machine comprising a box and an inclined screen wire traversing the box at an angle in an upwardly slanted direction, thereby subdividing the box into an upper and a lower chamber. The upper chamber 46 is provided with feeding means 24 for the pulp and the lower chamber 47 is provided with discharge means 28 for the drainage water. The suspension of fibrous material (the pulp) is fed to the upper chamber under a certain pressure which, in conjunction with a specific arrangement of the water discharge outlet of the lower chamber, causes the liquid suspension in the upper chamber to assume a higher level than the drainage water in the lower chamber. The screen is passed through the liquid in the upper and the lower chamber, thus forming the dividing plane between both chambers, and the formation of the sheet takes place on the upper side of the screen.

On the part of the screen passing between the chambers below a level, corresponding to that of the drainage water in the lower chamber, sheet formation takes place as in a cylinder machine, i.e., exclusively through the difference in hydrostatic pressures between the liquids in the upper and lower chambers. This makes it possible to obtain a paper made on a long wire as used in fourdrinier machines which fully corresponds in quality to cylinder-made paper. Since the arrangement of the screen permits the same to be made of any desired length, while the opposite is the case with cylindrical screens, provision can be made for an exceptionally long zone of sheet formation which greatly increases the performance of the machine.

The sheet is formed by depositing the fibers contained in the suspension fed into the upper chamber 46 onto the ascending reach 55 of screen 54.

The first stage of sheet formation below the drainage water level 32 is due entirely to the difference between the hydrostatic pressures of the suspension above, and the drainage water below the ascending reach 55 of the screen 54, i.e., the upper end and the under side of the upper reach of wire 54 are simultaneously in contact with the liquids in the upper and the lower chamber respectively, over an extended zone of the wire. After an eventual further dehydration of the sheet with the aid of a moderate vacuum corresponding to an approximately 10 to 20 mm. water column, which depression is generated in the portion of the lower chamber 47 above the drainage water level 32 by means of a suction pump attached to a line 42, and after still further drying by the action of the flat suction box 35, the sheet is lifted from the screen with the aid of an upper felt.

*Patent attorney, 17600 Pinehurst, Detroit 21.

Method of shipping cellulose pulp in bulk

U. S. 2,884,147, issued April 28, 1959, to Reed O. Hunt, Einar W. Erickson, Wilbur J. Lowndes, James D. Wethern and James G. Coma and assigned to Crown Zellerbach Corp., describes a method of shipping cellulose pulp in bulk.

The first step in the method, which occurs at the location where the pulp is produced, involves the partial dewatering of the pulp with the forming of a continuous blanket or sheet from the pulp. Thus, the pulp, after standard processing operations in the pulp mill, is delivered by pump or gravity head in fluid-slurry form for the partial dewatering operation.

The dewatering operation can be done satisfactorily on a modified "Kamyr" machine or a machine corresponding in part to a paper-making machine with the drying section entirely omitted. Rotary press rolls are used with the cylinder former to produce a continuous pulp sheet having the consistency of from 20 to 50 per cent with the preferred consistency range being from 25 to 40 per cent. Such a modified "Kamyr" machine of the type mentioned—a machine in which no "drying" (as distinguished from partial dewatering) takes place—is capable of high-capacity production with only a minimum of cellulose damage.

The continuous pulp blanket or sheet is then shredded into particulate form, as the second step in the carrying out of the method. Preferably, the last press roll feeds the pulp sheet over a bed plate serving as a breaker edge for the shredding operation. A suitable and satisfactory shredder can be made with a number of spaced discs secured on a common shaft.

The shredder throws the pulp particles into a chute leading to a moving belt conveyor. The pulp is carried on this belt conveyor to a stock pile. A drag conveyor, together with another moving belt, is used for delivering pulp from the stock pile into chutes which lead to compartments in the ship's hold when the pulp is to be loaded into the ship.

The particulate form of the shredded pulp lends itself very well to mechanical conveying to and from storage-stock piles and to the transport-loading site.

The cargo ship (by which the pulp, in bulk and in particulate form, is conveyed to the desired location for pulp utilization), has its cargo hold not only divided into separate compartments, but is provided at the bottom with water-delivery nozzles, whereby water is supplied for slushing the pulp and for forming a pool at the bottom of the pulp mass when the pulp cargo is to be unloaded hydraulically.

As the shredded pulp is dropped down by the chutes into the various compartments in the hold of the ship, the pulp compacts to a considerable extent under its own weight, since in its particulate form the pulp is compressible. If necessary, a standard ship's trimmer is used to fling the pulp into out-of-the-way corners of each hold compartment during the ship-loading operation.

The depth of the ship's hold causes considerably more self-compaction of the pulp to take place than would occur in much shallower bins or compartments, such as those of trucks or railway freight cars. This compaction is also an important factor in the efficient utilization of cargo space and contributes in enabling transportation of the pulp by ship to be carried out at maximum capacity and minimum cost.

The fourth step in the method takes place after the ship, with its cargo of pulp, arrives at its destination where the pulp is to be unloaded and subsequently converted. Hydraulic unloading of the pulp is an essential feature of the method. In order for the pulp to be unloaded hydraulically from the ship, the pulp must

.. Fluid Power news

REPORT NO. 12,103
"HYTAC"* SYSTEMS ON NEW PAPER MACHINE

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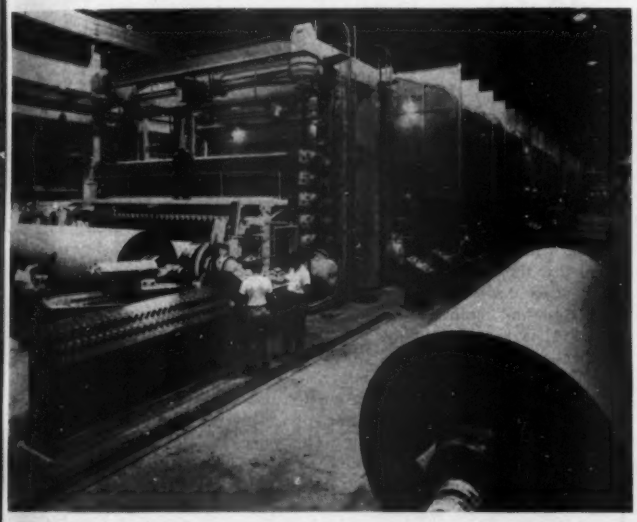
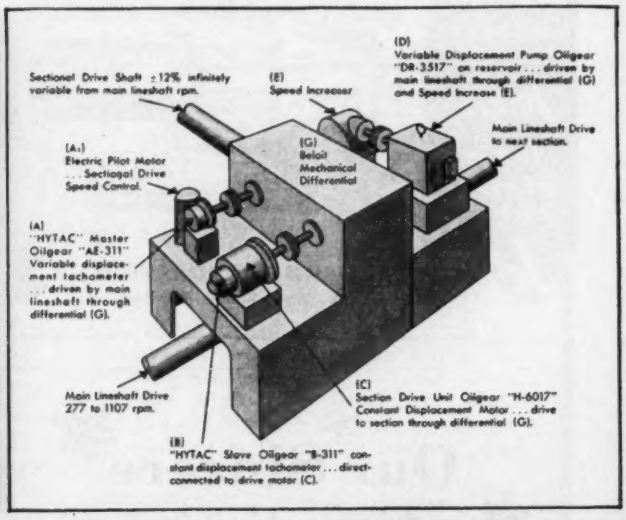
HOW OILGEAR "*ANY-SPEED*" DRIVES ON NEW PAPER MACHINE ACCURATELY CONTROL SECTION SPEEDS

USER: *West Virginia Pulp and Paper Company (Westvaco) (Builder—Beloit Iron Works, Beloit, Wisconsin)*

DATA: Systems to individually vary and accurately control speeds on four sections of a new, 264-in., $25,000,000 paper machine that will produce up to 225 tons daily of a revolutionary, patented, smooth, extensible kraft sheet. Machine is powered from a block-long main lineshaft with mechanical differentials at each section. Main lineshaft speed will vary over a 4:1 range—from 277 to 1107 rpm.

REQUIREMENTS: 1. A system that, when applied to each of four mechanical differentials, will provide individual, precision-controlled, infinitely variable increase or decrease of 10% over or under main lineshaft speed—as selected from 2 local, and 7 remote push-button stations. 2. Each system to maintain selected speed for its section within ±0.25% max. variation over a 50% load change at max. lineshaft speed. 3. Systems must also be: a. Compact. b. Impervious to moisture and daily high-pressure "wash-down." c. Thrifty on electrical power input. d. Trouble-free for continuous, heavy-duty, full-production paper machine drive service.



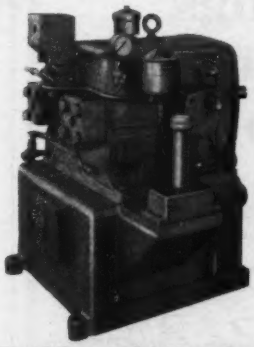

(D) Variable Displacement Pump Oilgear "DR-3517" on reservoir . . . driven by main lineshaft through differential (G) and Speed Increase (E).
Sectional Drive Shaft ±12% infinitely variable from main lineshaft rpm.
(E) Speed Increaser
Main Lineshaft Drive to next section.
(A1) Electric Pilot Motor . . . Sectional Drive Speed Control.
(G) Beloit Mechanical Differential
(A) "HYTAC" Master Oilgear "AE-311" Variable displacement tachometer . . . driven by main lineshaft through differential (G).
Main Lineshaft Drive 277 to 1107 rpm.
(C) Section Drive Unit Oilgear "H-6017" Constant Displacement Motor . . . drive to section through differential (G).
(B) "HYTAC" Slave Oilgear "B-311" constant displacement tachometer . . . direct-connected to drive motor (C).

SOLUTION: *Application-Engineered* Oilgear *Hytac** (hydraulic tachometer) controlled drives provide precise, individual speed control on each of four sections—3rd dryer, 1st calender, 2nd calender, and winder reel of Westvaco's new #3 kraft machine shown above. Drawing, above right, shows components of typical sectional drive. *These highly accurate, compact, heavy-duty systems have met or exceeded all originally specified requirements.* Examples: 1. Specified ±10% infinitely variable sectional speed control range exceeded by providing ±12% in actual operation. 2. Selected speeds are maintained within specified limits *regardless* of load change. 3. Production speeds increased to over 2000 fpm. Important "Oilgear-plus" features are: 1. Dual winder control that, with the mere flip of a control panel switch, converts winder drive from speed-controlled to tension-controlled . . . speed control prevents tearing the tail strip when starting a new core, while tension control provides good roll quality at full sheet width. 2. Cushioned, controlled acceleration and deceleration. 3. Positive overload protection. 4. Pressure and flood lubrication with continuous power fluid filtration.

OPERATION: Fluid from master tach (A) gives section drive speed command to control on pump (D). Slave tach (B) feeds back a flow signal proportional to actual section drive speed. When main lineshaft speed is increased or decreased, fluid flow from master tach (A) automatically increases or decreases to command section drive to follow lineshaft speed change. Through local or remote pushbutton stations connected to electric pilot motor (A_1) on master tach (A), operator can increase or decrease speed of each *Hytac* section infinitely up to 12% of prevailing lineshaft speed.

A second Westvaco kraft machine will have an *Application-Engineered* Oilgear Controlled Motion System to cover a 10:1 lineshaft speed range, and a wider sectional

*"HYTAC" Systems—An Oilgear Trademark



Left: Oilgear Sectional Drive Pump (D) with integral reservoir. *Right:* Oilgear Sectional Drive Motor (C) with direct-connected *Hytac* slave (B) to left.

Fluid Power drives and controls were selected after three years of development on this process and machine—from a 2-in. table model, through a 15-in. laboratory model and 60-in. pilot model. Conventional variable speed drives could not provide the sectional speed control required. "*Equipped with the most advanced precision controls known to the industry . . .*"—is the statement Westvaco has made concerning their new #3 machine.

. . . for the lowest cost per year—it's Oilgear!

For similar practical solutions to YOUR linear or rotary Controlled-Motion problems, call the factory-trained Oilgear Application-Engineer in your vicinity. Or write, stating your specific requirements, directly to . . .

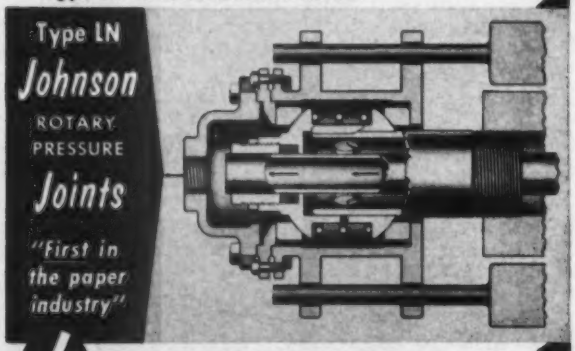
THE OILGEAR COMPANY

Application-Engineered Controlled Motion Systems

For High Speed Paper Machines with Revolving Syphon Pipes

In the Type LN Johnson Joints the revolving syphon pipe is made a part of the rotating assembly, yet is permitted longitudinal movement. Sealing is still accomplished without packing. Simple support rods carry all the weight of joint and connections, permit the rotating assembly to "float" freely inside. Special hangers and brackets adapt the mounting for machines with either open or enclosed gearing.

Johnson Joints fit all needs on paper machines, calenders, corrugators, waxers, embossers, roofing machines, printing presses. For full data on Type LN write for Bulletin N-2002.



THE JOHNSON CORPORATION
845 Wood St., Three Rivers, Michigan

Our Sincere Greetings of the Season

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Frank J. Hallin
Frank C. Arnold
Horace B. Hill, Jr.
Donald Krueger
T. J. McCombe
W. Mulcahy
George Dayton

WISCONSIN WIRE WORKS

Patent Reviews . . .

be mixed with water to reduce the consistency to such an extent that the mixture can be pumped out from the ship's hold in a satisfactory and efficient manner. To accomplish this properly, the consistency of the mixture, when it is to be drawn out by the pumps, should be reduced from 1 to 9 per cent (the preferred consistency range for such pumping is from 2 to 5 per cent).

For the purpose of reducing the pulp consistency or increasing the amount of water in the mixture, the ship is equipped with water-discharging nozzles 11 (Figure 3) on the inside of the

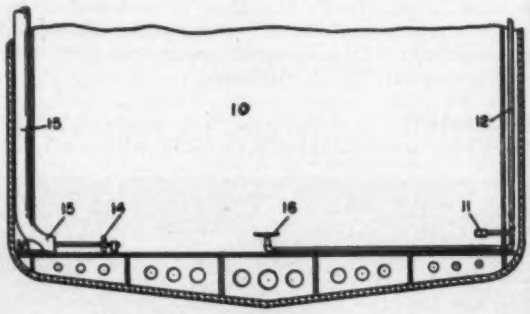


Fig. 3

bottom of each hold compartment in which the pulp is carried. These nozzles 11 are mounted on suitable conduits or pipes 12, which in turn are provided with suitable connections (not shown), so that they can be connected by hose lines with a suitable source of water under pressure at the unloading dock.

Agitating means, such as the driven rotating propeller indicated at 14, is provided in the bottom of each compartment to aid in the slushing of the pulp by breaking up any lumps of pulp in the pool. Such an agitator also serves to minimize the possibility of any plugging occurring in the suction line to the pump (the pump not being shown). The agitator, preferably, is positioned close to the intake of the suction pipe (indicated at 15) through which the pulp is drawn by the pump from the bottom of the compartment.

In addition to the stationary water nozzles in the bottom of each compartment, a swing nozzle indicated at 16 is also preferably provided in each compartment. Such a swing nozzle helps additionally to wash the last remnants of pulp from the compartment during the completion of the unloading.

Manufacture of wallboard

U. S. 2,889,242, issued June 2, 1959, to Charles F. Teichmann and assigned to Texaco Development Corp., describes a method of manufacturing wallboard.

Relatively coarse fragments of fibrous solids are mixed with water to form a flowable mixture. The mixture is passed as a flowing stream through a heating zone, the water being vaporized, thus forming a continuously flowing dispersion of fragments in steam. This dispersion is then passed through a nozzle at a velocity greater than 25 ft. per second. The turbulence thus created disintegrates the coarse fibers into finely divided fibers, which rae subsequently slurried and formed into a sheet on a fourdrinier machine.

Apparatus for coating paper

U. S. 2,888,902, issued June 2, 1959, to Archibald H. Wells and William T. Crayford, assigned to the Bowater Research & Development Co., describes an apparatus for coating a travelling web of paper.

The travelling web passes between a pair of relatively hard, smooth-surface applicator rolls which apply the coating to it. Each applicator roll is provided with a relatively soft, resilient surface gate roll rotating in the opposite direction and forming a pool of the fluid coating material at the nip between the gate and applicator rolls and metering the flow of fluid onto the surface of the

applicator roll. Two relatively soft, resilient surface smoothing and spreading rolls also contact each applicator roll, rotating in a direction opposite to that of the applicator roll, smoothing and evenly spreading the coating material across the surface of the applicator roll. The travelling web then passes between heating elements.

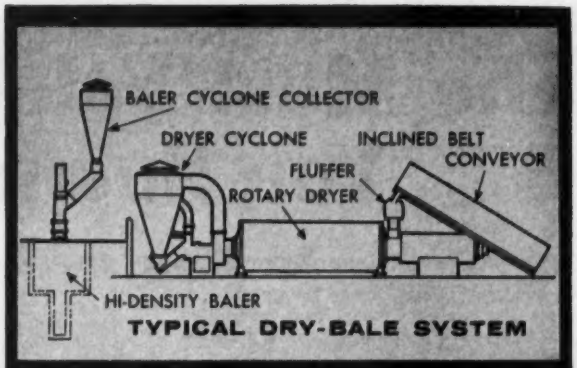
Evaporation of sulfite waste liquor

U. S. 2,888,982, issued June 2, 1959, to Torsten Ramen and assigned to Pedar Ltd., describes a process of evaporating sulfite waste liquor in a multi-stage evaporation installation, in which the waste liquor is initially evaporated in one or more stages operating at relatively low temperatures and reduced pressure, and is then further evaporated in a number of stages operating at higher temperatures. The object is to eliminate or inhibit the formation of incrustations in the intermediate stage, thereby avoiding excessively frequent cleaning of the heating surfaces of this stage.

The object is achieved by passing the liquor from the stages operating at low temperatures directly to the stage operating at the highest temperature and subsequently passing the liquor to a stage operating at an intermediate temperature. Thus, in a five-stage evaporator, the liquor flows through the following stages in order (the highest numbers being at the lowest temperatures): 4, 5, 1, 3, 2. By passing the liquor to the first stage, from the fifth stage, the liquor is heated practically immediately to the temperature prevailing in this stage (115°C.), so that practically all precipitation of calcium sulfate occurs directly in the circulating liquor and very little deposits directly on the heating surfaces.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Multiple section paper tube	Sonoco Products Co.	2,888,043	5/26/59
Broke removal unit for paper machinery	Black-Clawson Co.	2,888,073	"
Suction press assembly	Beloit Iron Works	2,888,074	"
Divisible carton for cigarettes	Waldorf Paper Products Co.	2,888,132	"
Can sleeves	Waldorf Paper Products Co.	2,888,135	"
Molded fiber support for container carrier	Diamond Match Co.	2,888,164	"
Molded pulp egg carton	Diamond Gardner Corp.	2,888,183	"
Paperboard drum	Excello Paper Products Co.	2,888,184	"
Compartmental box	American Box Board Co.	2,888,185	"
Filler structure	Waldorf Paper Products Co.	2,888,186	"
Bag	Bemis Bro. Bag. Co.	2,888,187	"
Paper making machine	Milton J. Maguire	2,888,378	"
Bag bottom forming apparatus	Windmoller & Holscher	2,888,859	6/2/59
Conical paper container	Jagenberg-Werke A.G.	2,888,861	"
Carton package	Container Corp. of America	2,889,040	"
Container carrying handle	American Can Co.	2,889,041	"
Carton with hinged lid	Container Corp. of America	2,889,100	"
Reclosable pouring opener for containers	Bergstein Packaging Trust	2,889,101	"
Corner gusset lock for containers	Fibreboard Paper Products Corp.	2,889,102	"
Cover-locking carton	American Can Co.	1,889,103	"
Carton handle construction	Irving caster and Irving Feldman	2,889,104	"
Dispensing carton	Sutherland Paper Co.	2,889,977	6/9/59
Cartons	Creath Q. Linville	2,889,978	"
Bag	Bemis Bro. Bag Co.	2,889,979	"
Doctor for paper machine	Vickerys Ltd.	2,890,473	6/16/59
Paper napkin	Scott Paper Co.	2,890,540	"
Paper-box machine	Food Machinery & Chemical Corp.	2,890,630	"
Fibreboard apparatus	Celotex Corp.	2,890,748	"
Sheet dispensing carton	Cornell Paperboard Products Co.	2,890,791	"
Dispensing carton for rolled material	Old Dominion Box Co. Inc	2,890,821	"
Convertible shipping container	Crown Zellerbach Corp.	2,891,710	6/23/59
Package and bird feeder	The Early & Daniel Co.	2,891,711	"
Spirally wound container tube	The Cleveland Container Co.	2,891,714	"
Packaging means	Joseph H. Vineberg	2,891,715	"
Valve bag with pasted end closure	St. Regis Paper Co.	2,891,716	"
Grinding apparatus for fibrous materials	Aktiebolaget Defibrator	2,891,733	"
Manufacture of sulphite cellulose	Aktiebolaget Celleco	2,891,886	"
Sulphite liquor base resin	Curt Uschmann	2,891,918	"
Fiber board positioner	Minnesota and Ontario Paper Co.	2,892,213	6/30/59
Manufacture of handle attachments for paper bags	Canada Paper Co.	2,892,244	"



TYPICAL DRY-BALE SYSTEM

Halifax Power & Pulp Ltd.

dries groundwood pulp to 90% air-dry

Halifax Power & Pulp Ltd., using the Dry-Bale system, is now drying groundwood pulp at Sheet Harbor, Nova Scotia. The new system reduces shipping costs . . . saves storage space . . . permits pulp to be shipped to distant markets. The pulp is readily dispersible, requires less handling, and can be stored in warm climates.

An integral part of the new system is the Heil dryer. A stream of hot air carries the fluffed pulp through the dryer . . . fine fibers are quickly dried and carried away, while wetter, heavier fibers move more slowly for longer exposure to the drying medium. Result: uniform drying of all fibers.

Compound showering flights on each of the three drums eliminate surging and provide maximum utilization of the drying medium.

For descriptive literature on the new Dry-Bale system and the Heil dryer, write The Heil Co.

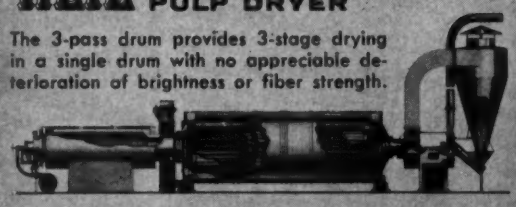
THE HEIL CO.

(Manufacturers of the Arnold Dryer)

3000 W. Montana St., Milwaukee 1, Wisconsin

HEIL PULP DRYER

The 3-pass drum provides 3-stage drying in a single drum with no appreciable deterioration of brightness or fiber strength.



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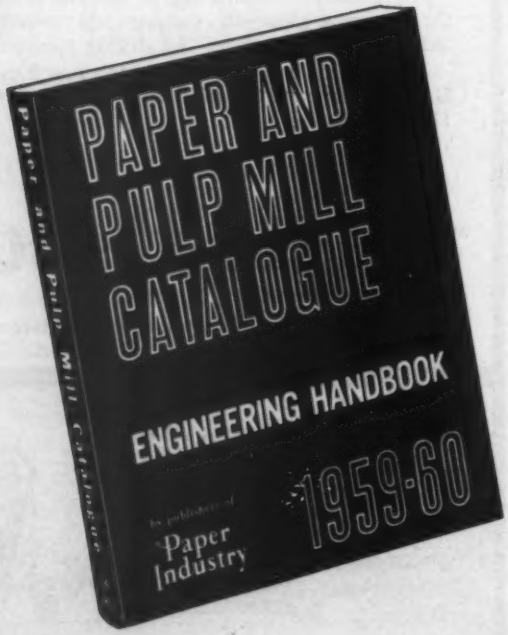

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. . . contributions by leading scientists on making more and better paper at less cost — experiments, treatments, solutions to immediate and long range problems . . .

. . . studies on how to increase productivity through the use and integration of modern equipment . . . the use of new and improved chemicals . . . studies of marketing trends . . . new processes and methods . . .

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NEW PRODUCTS

These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

Condensate flow regulator

The micro-adjustable orifice (Series 300), essentially an adjustable needle valve encased in a sight glass, is designed to replace steam traps for drainage of heating and processing units operating continually at pressures up to 60 psi.

Made for pipe sizes from ½ to 1 in., the orifice works without moving parts, providing continuous circulation of condensate. The sight glass and optional dial thermometer permit a constant visual check on the flow of condensate and temperature of steam inside the steam-operated unit. *Stickle Steam Specialties Co.*

Circle No. 11 on Readers' Service Card

Perforating head

The new Slit-Score perforating head produces a slit-score, tear-off perforation on roll toilet tissues and toweling.

The new unit, which can be installed on any make of toilet or towel-roll machines, uses solid, quickly interchangeable blades that are mounted in the bed-roll for maximum protection. These blades are set at an angle to the anvil blades to minimize wear and keep drive-power requirements at a minimum.

The anvil blades are mounted in a fixed position and pivot on a fulcrum during operation. This eliminates the need for flexing blades. Air cylinders rapidly disengage the entire perforating head. *Dietz Machine Works.*

Circle No. 12 on Readers' Service Card

Synthetic lubricating oil

Anderol L-386, a medium viscosity synthetic di-ester, has an operating temperature range of −65° to 350°F., a viscosity index of 206 and an evaporation rate of 5.1. Other properties include built-in rust protection and anti-foam. Corrosion tests with steel and aluminum are said to have revealed complete rust protection for 200 hours in a humidity cabinet.

Non-gumming, compatible with ordinary lubricants and possessed of low sheer characteristics, Anderol L-386 is suggested for use in hydraulic systems, pneumatic systems, machine tools, radar systems and precision instruments. Available in pint, quart and gallon cans, 5- and 55-gal. drums. *Industrial Lubricant Div., Lehigh Chemical Co.*

Circle No. 13 on Readers' Service Card

Sequestering agent

Plexene XX, used for iron removal, deinking and removing carbon from paper in the paper industry, has also found application in bottle washing operations, the textile industry, lattice stabilization and in emulsion polymerization to stabilize particle size.

An aqueous solution of an organic sequestering agent for chelating ferric iron through a pH range of 3 to 14, Plexene XX is effective in chelating calcium, magnesium, copper and other di- and tri-valent metals. *Tanatex Chemical Corp.*

Circle No. 14 on Readers' Service Card

Electronic solution controller

Controlling caustic, acidic or aqueous-solution concentrations, the automatic electronic solution controller system can be used with either continuous or batch-type metal washing equipment, plating processes, chemical process systems, textile bath equipment or any application where precise concentrate levels must be maintained.

Withstanding rugged use in industrial plants, the equipment is manufactured to NEMA and JTC specifications. Typical advantages over manual control: consistent product quality; elimination of solution sampling periodically; complete safety against operating hazards. *Electro Mechanisms Corp.*

Circle No. 15 on Readers' Service Card

Protective coatings

A modified series of protective coatings, developed from a formula based on the new synthetic resins, (epoxies, silicones, etc.) is now available on the American market.

Named Sakaphen, these coatings are said to offer protection to such metals and concrete surfaces as chimneys, breechings, precipitators, condensers and other equipment subject to dew-point corrosion in

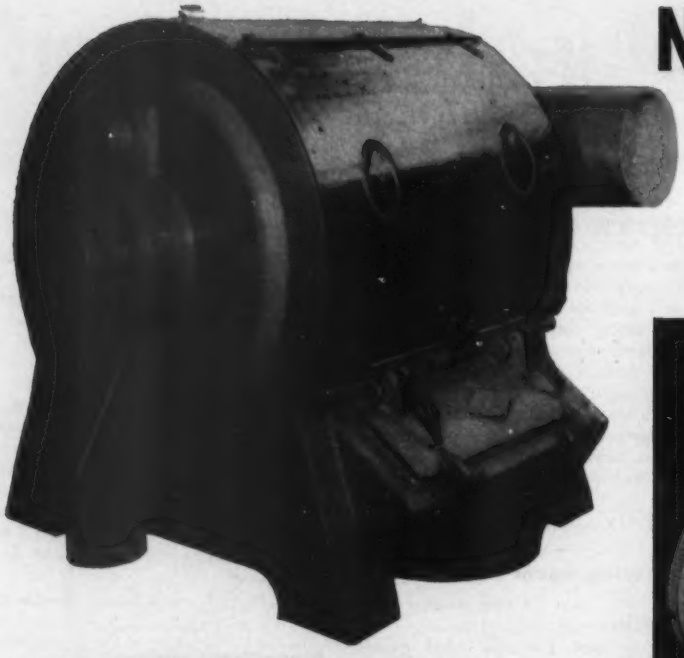
Tree-crushing machine

A portable, 95,000-lb. tree smasher and crusher for reclaiming unproductive forest land is now available. Estimated cost per acre of cleared land has been rated at $3.50 which compares with costs of 9 to 12 dollars per acre for the same job done with bulldozers, dynamite and other conventional methods.

In operation, the diesel-electric machine pushes trees to the ground and smashes them into splinters with a heavy blade-studded steel roller.

The machine is 37 ft. long, 12 ft. high, with two rollers, 12 ft. wide and 5 ft. in diameter. *R. G. LeTourneau Inc.*

Circle No. 16 on Readers' Service Card



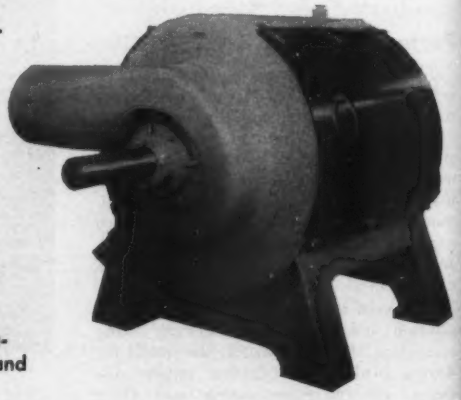
NEW ADVANCES IN LOW COST QUALITY PULP SCREENING

impco CENTRIFUGAL SCREENS FOR:

Washed Stock Screening
Hot Stock Screening
Sealed Black Liquor Knotting
Fibre Length Classification
Paper Stock Cleaning

The new Impco Centrifugal Pulp Screen is the latest example of the progress made toward the ultimate in low cost quality screening. This screen incorporates many improved principles and features such as:

— a stock inlet allowing direct top, bottom, front or rear infeeding which simplifies installation piping;
— a tangential inlet which changes flow direction from linear to rotating, yet retains velocity head;
— a special stator which provides uniform internal distribution of pulp;
— a patented high-efficiency rotor which increases capacity without additional horsepower;*
— a bottom accepted stock outlet permitting all sub-floor piping;
— a full length quick-opening door for routine accepted stock sampling;
— an accessible rejects outlet for tailings inspection or sampling.



These features are resulting in peak capacities and high discharge consistencies at lowest horsepowers. Reject richness is readily controlled. Engineered simplicity is characteristic of the entire line of Impco Centrifugal Screens which require very little operating attention and mechanical maintenance.

* U. S. Patent No. 2,845,848.

IMPROVED MACHINERY INC.

NASHUA, NEW HAMPSHIRE

IMPCO®

In Canada, Sherbrooke Machineries Ltd., Sherbrooke, Quebec

New Products . . .

connection with dilute sulfuric acid and other destructive chemical fumes. Sakaphen is reported to withstand the destructive influence of acids and alkalis at saturated temperatures up to 300°F. *American Sakaphen Corp.*

Circle No. 17 on Readers' Service Card

Paper-roll grab

Attached to the company's Model J truck, this 180° rotating paper-roll grab is capable of handling a roll range of 23 to 40 in. in both the vertical and horizontal positions. The 180° rotation allows the operator to set the roll on either end and the thin arm design makes it possible to break out vertical rolls from the most tightly stacked freight cars and warehouses. *Lewis-Shepard Products Inc.*

Circle No. 18 on Readers' Service Card

Digger-loader combination unit

This tractor-mounted, digger-loader combination has a single sub-frame support and a common hydraulic power system.

The loader has a 5000-lb. breakaway capacity and a full-lift capacity of 2500 lb. on Ford Industrial and Fordson Power Major tractors.

With an 18-ft. reach at grade and 12 ft. below grade, the "Panther" digger delivers a 19,250-lb. digging force and is completely detachable from the tractor in 2 min.

Both digger and loader may be simultaneously operated. *Sherman Products Inc.*

Circle No. 19 on Readers' Service Card

Electric vibrator

This water and dust-tight Electric vibrator (RC line) precludes operational failure due to constant exposure.

The vibrator employs a rotating eccentric shaft principle of developing vibration and is self-contained with no pulleys or belts.

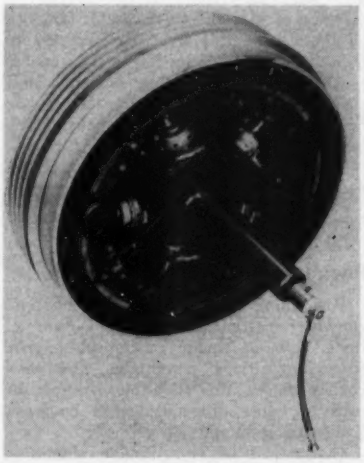
With a working frequency of 3600 impulses per minute (corresponding to 60 cycles per second), the RC line is available in three-phase, a.c. in all common voltages. *Cleveland Vibrator Co.*

Circle No. 20 on Readers' Service Card

Re-moistenable adhesive

Re-tac, a clear, water-white, re-moistenable adhesive, will dry transparent and tack-free when applied to acetate and other plastics. When moistened with water, the acetate or plastic may be applied immediately to glass, metal, paper, wood and other materials. *Adhesive Products Corp.*

Circle No. 21 on Readers' Service Card



Slip clutches

Designed to dissipate head and give uniform torque output at immediate speeds, these air-cooled, air-actuated slip clutches range in size from very light applications to heavy-duty installations.

Center winding tension control, obtained by an air gauge showing the pressure at which the clutch is operating and what tension is on the roll material, is said to markedly reduce error on the part of the individual operator. One pressure regulating control (automatic or manual) operates the clutch. *Horton Mfg. Co. Inc.*

Circle No. 22 on Readers' Service Card

Slimicide

A new propionate, mercury-based slimicide, introduced for use in the paper industry, is said to cut slime treatment costs by 1/3 and to provide 25 to 35 per cent more effective control.

Metasol, in addition to a more rapid and sustained rate of kill than conventional slimicides, is reported to have high, fast solubility in water, and minimum deactivation properties. Tests over extended periods of treatment have indicated that microorganisms do not build up a resistance to the compound's toxic effects. Available in either solid or liquid form. *Metasol Div., Metalsalts Corp.*

Circle No. 23 on Readers' Service Card

Reducers

The All-Motor Motoreducer line, extended by the addition of size 8E, increases the line's application range, especially in the lower speed ranges. Size 8E, a compact, high horsepower drive, has many distinctive features which include all-steel housing, large overhung load capacity, positive lubrication and extra-depth, high-pressure angle gear teeth that are inherently stronger than ordinary helical teeth. *Falk Corp.*

Circle No. 24 on Readers' Service Card

Insulation papers

Three forms of Crystal M, a new line of insulation papers, are now available. Prepared from a special-type mica paper, one form is 100-per cent mica. The other two contain fibers introduced during the manufacturing process.

The paper may be manufactured in calipers from 2 to 10 mils, but is now available at 5 mils only. Paper density may vary from 0.6 to 1.7 g/cm³ depending on construction.

The new papers are expected to find application as fire-resistant materials, thermal

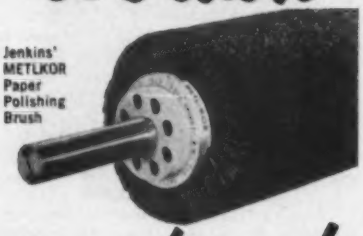
STOP TELESCOPING ROLLS • MUSHROOMING CORES

Use HORTON Clutches and Brakes to control the sheet tension on your center winders and back stands. Take the guess work out of tensioning and let Horton equipment give you uniform good rolls all the time.

VARIABLE SPEED CLUTCH PULLEYS
GOVERNOR CONTROLLED BRAKES

HORTON MFG. CO., INC.
MINNEAPOLIS 14, MINNESOTA

"a brush



is a brush

is a brush"

Poetically speaking, true! But there's no brush like a Jenkins' METLKOR brush. Paper Mill men everywhere say it's true. There are "Look-Alikes", "Just-as-Goods", "Steals", "Terrific Bargains" . . . but only one Jenkins' METLKOR. They are built better, to perform better, to last longer. Result . . . improved product, greater satisfaction and economy.

JENKINS' PAPER MILL BRUSHES

Blanket washer • Coating • Conveyor • Dampening • Dusting • Feed • Felt cleaning • Flocking • Fourdrinier wire cleaning • Nutmeg roll cover • Offset powder removal • Paint brush • Polishing • Scrap removal • Sieve • Spray • Static elimination • Void detector • Web cleaning.

BRUSHES FOR PRINTERS: Cylinder hold down • Dusting • Nutmeg roll cover • Offset dampener roll cleaning • Offset powder removal.

Specify Jenkins' METLKOR
the original . . . the best Metal-Core brush

METLKOR®
CYLINDER BRUSHES
and LIFEWOOD® WOOD BACKED BRUSHES

M. W. JENKINS' SONS, INC.
Serving Industry for Over 80 Years
642 Pompton Ave., Cedar Grove
Essex County N. J. • CEnter 9-5150

New Products . . .

or electrical insulation and a variety of other uses including fire-resistant document paper. *Minnesota Mining & Mfg. Co.*

Circle No. 25 on Readers' Service Card

New coating for paper

Both the wet-strength and water absorbency of paper can be increased by impregnating it with a reaction product of formaldehyde and poly-ε-caprolactam, a 2—oxohexamethylenimine.

Polycaprolactam-coated papers are produced by extrusion coating onto kraft paper and other substrates. Good adhesion for coatings of one mil or thicker is obtained by the use of this technique. Because of their resistance to tearing and abrasion, plus their excellent tensile strength, such coated papers are suitable for the production of inexpensive handbags, belts, shoes, etc. *National Aniline Div., Allied Chemical Corp.*

Circle No. 26 on Readers' Service Card

Pocket-size circular slide-rule

Performing multiplication, division, combined multiplication and division, fractions, squares, square roots, cubes, cube roots, proportions, percentages, areas and circumferences, this slide-rule also can be used to figure discounts, retail mark-ups and fuel consumption.

Constructed of two durable aluminum discs and a clear plastic hairline indicator, surfaces in glare-free green and gold, the slide-rule has a diameter of 3-½ in. *Edmund Scientific Co.*

Circle No. 27 on Readers' Service Card

Different weighing system

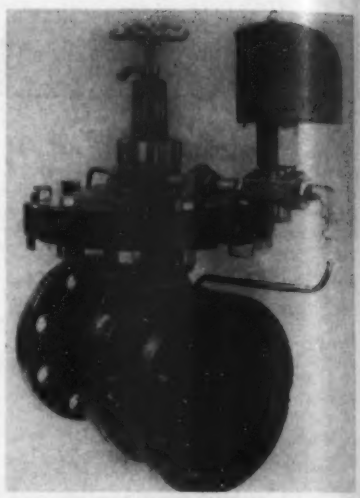
Available in three sizes for loads from 0-300 lb. to 0-180,000 lb., the Air-Mount weighing system can be used to weigh the contents of bins, tanks, truck tanks, conveyor loads and anything that can be weighed on conventional platform scales. The weighing units are reported to have a repeatable accuracy of better than 1/10th of one per cent, according to tests made by the National Bureau of Standards. *Weber Air-Weigh Co.*

Circle No. 28 on Readers' Service Card

Refrigerated compressed air dehydrator

The Refrigifilter, a refrigerated condenser-type filter, is now available. This new unit lowers the dew point of the compressed air to −10°F. at 100 psig, thus removing vaporized and entrained moisture and oil from the compressed air. Atmospheric dew points of −30°F. are said to be obtainable. *Hankison Corp.*

Circle No. 29 on Readers' Service Card

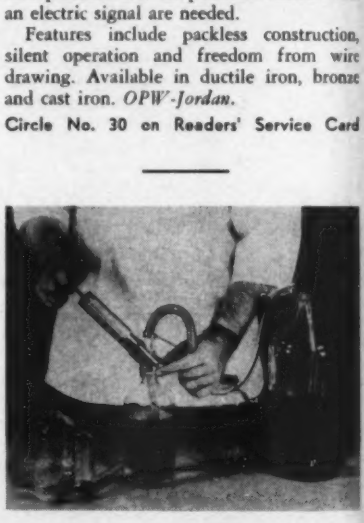


Solenoid actuated regulator

A line of solenoid actuated regulators, now available, are reported suitable for maximum temperatures of 500°F. and pressures of 250 psi. The regulators may be used wherever remote shut-off, remote start-up, automatic shut-off, and combination pressure and temperature control with an electric signal are needed.

Features include packless construction, silent operation and freedom from wire drawing. Available in ductile iron, bronze and cast iron. *OPW-Jordan.*

Circle No. 30 on Readers' Service Card



Vacuum sampling pump

The Model D vacuum pump is available in both stainless steel and aluminum; interchangeable parts (steel or aluminum) can be furnished in any combination to meet individual needs. The equipment, fitting neck-opening sizes from 22 mm. to wide-mouth mason jars, is said to handle liquids up to syrup consistency as well as powdered solids tending to seek their own level. *W & W Manufacturing Co.*

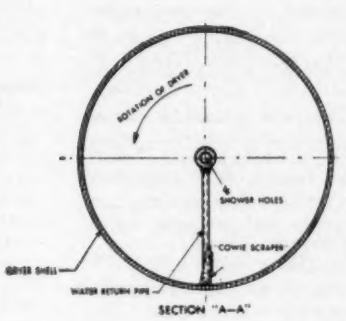
Circle No. 31 on Readers' Service Card

Medium-voltage starter

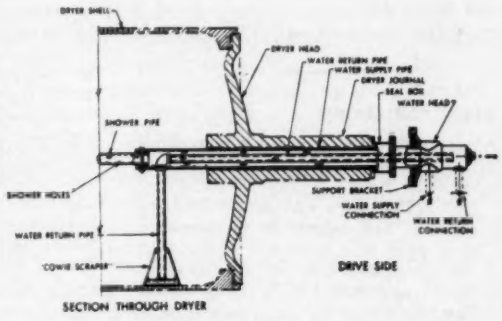
Limitamp Control, a re-designed medium-voltage a-c motor starter, features a new draw-out contactor and fuse-shelf assembly. It is designed to provide short-

RMF

COWIE SCRAPER ASSEMBLIES



SECTION "A—A"



SECTION THROUGH DRYER

remove condensate quickly, completely... allow an even heat transfer from dryer to sheet

Heat transfer to the sheet suffers greatly when condensate accumulates on the inside of the dryer, preventing rimming and causing the condensate to collapse in a cascading effect which require additional steam pressure and increasing drive load as a means of drying the sheet properly. Even after this has been done, not all the paper will be salable due to wet spots and uneven drying. To avoid condensate rimming collapse . . . and the adverse effect of cascading and to lower production cost, we suggest a Cowie Scraper Syphon Assembly.

The Cowie Scraper is the business end of a rigid stationary syphon. As the dryer rotates, centrifugal force throws the condensate to the edge where the neoprene strip of the Cowie Scraper removes the condensate, evenly scooping it up into the syphon. The thin layer that exists on the inside of the dryer shell is not sufficient to greatly impede heat transfer to the sheet—resulting in considerable steam economy. Maintenance on the Cowie Scraper is minimal. The unit is rigidly mounted to prevent drum scoring and the only revolving part is the steam seal housing.

For further information on the Cowie Scraper and other fine products designed and developed specifically for the paper industry, write to:

ROSS MIDWEST FULTON · Dayton, Ohio
Division of Midland-Ross Corporation

New Products . . .

circuit protection and coordinated control for squirrel-cage, synchronous and wound-rotor motors up to 3000 hp., rated from 2300 to 4600 volts.

Said to effectively withstand high humidity and corrosive atmospheres, the Limitamp has special significance for the paper and pulp industries. It can be used to start the driving motors on Jordans, refiners, beaters, pulpers, chippers, etc. *General Electric Co.*

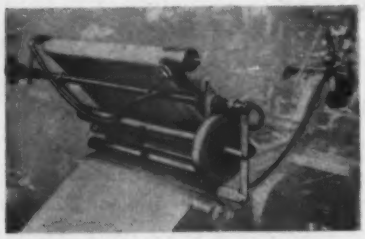
Circle No. 32 on Readers' Service Card

Steel roll clamp

A steel-alloy roll clamp is now available as an accessory for the manufacturer's line of fork lift trucks.

The roll clamp, a manipulator of heavy paper rolls, is produced in three models. Clamps open to a maximum width of 65 in. on all models and can be operated to rotate a paper roll 360°. On two of the models, clamps can narrow to handle 10-in. dia. rolls. Maximum lifting weight is reported at 7000 lb. *Towmotor Corp.*

Circle No. 33 on Readers' Service Card



Edge guide unit

A vacuum- and spring-controlled edge guide unit for use in glue line applications on bag machines or similar converting processes is now available. This glue-edge guide unit is reported to be extremely sensitive and capable of holding a glue seam to less than a .030 variation. *Tidland Machine Co.*

Circle No. 34 on Readers' Service Card

V-belt drives

Modern synthetic fibers and rubbers are utilized to the fullest extent in this new line of V-belt drives. Said to be exceptionally stable, the Ultra-V belts are subject to little if any shelf shrinkage. Static conductors, and resistant to heat, oil and outdoor exposure, the belts cover the entire drive-requirement range from 1 to 1500 hp. with the following cross-sections: 3V, 3/8 in. wide by 5/16 in. deep; 5V, 5/8 by 17/32; 8V, 1 by 7/8.

Matching Ultra-V sheaves are cast from high-strength alloys, including ductile iron when required. *T. B. Wood's Sons Co.*

Circle No. 35 on Readers' Service Card

Vacuum blowers

These small-volume vacuum blowers, in ten sizes, are designed for capacities from 30 to 1000 cfm and vacuum to 20 in. Hg. in single stage application. The units may be compounded for vacuum service over 20 in. Hg.

Major design features listed by the manufacturer include elimination of internal valves, absence of contact between moving parts, virtual freedom from maintenance, maximum efficiency of rotor design and operating speeds, and minimum sealing-water requirements. *Roots-Connersville Blower. Div., Dresser Industries Inc.*

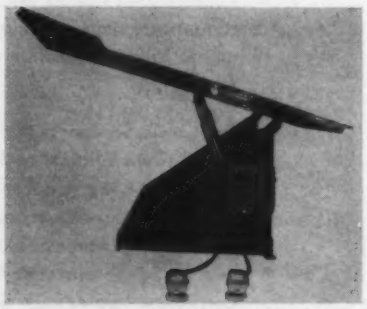
Circle No. 36 on Readers' Service Card

Paper pulp modifier

Acrylonitrile, when added in the pulp stage, modifies cellulosic structure through a process known as cyanoethylation. At the present time, the patented paper product is being used as the base of a new insulation system in one company's line of pole-type distribution transformers.

Addition of this highly reactive chemical to pulp for paper manufacture, resulting in rot resistance, improvement in acid resistance and dimensional stability of the finished product, suggests expanded application. *American Cyanamid Co.*

Circle No. 37 on Readers' Service Card



Bale lifter

This bale elevator, now available, used to lift and dump paper bales into a pulper, has a lifting capacity of 5000 lb.

The table, raised and lowered by foot-controlled switches, tilts 45° beyond the horizontal center line. Said to be capable of raising a paper bale 40 in. from the floor, the table has a length and width of 84 by 80 in. *D. J. Murray Mfg. Co.*

Circle No. 38 on Readers' Service Card

Epoxy repair kit

The Carbo Fix repair kit is a two-component, fast-setting epoxy material that cures to a hard, tough, tightly bonded patch. Using Carbo Fix, quick repairs can be made to pipes, tanks, machinery, plumbing, etc.

The repair kits are available in two types. Carbo Fix S is a general material with reportedly good chemical resistance for repairs to most surfaces, glass included. Carbo Fix C, described as having excellent chemical resistance, is recommended where chemical attack is a major consideration. *Carboline Co.*

Circle No. 39 on Readers' Service Card

Magnetic bowl traps

Permanently magnetic bowl traps, now available in seven standard sizes, 6 through 18 in. in two-inch increments, are said to be capable of withstanding pressures to 75 psi and temperatures to 650°F.

Designed for simple installation in liquid or slurry processing lines, the traps can be supplied in various types. The standard type has a welded pipe body and reinforced plate construction. The unit is also obtainable either with a Hysol epoxy resin coating or in all-stainless steel construction for resistance to corrosion. *Eriez Mfg. Co.*

Circle No. 40 on Readers' Service Card

Boiler-water control system

A side-stream automatic boiler-water control system is now available in standard models for all types of steam boilers up to 1000 hp. (custom-made units up to 6000 hp.). Equipped with the latest analyzing and sensing devices, safety and operating controls, this system combines and integrates side-stream filtration with chemical pretreatment, internal treatment, continuous minimum blowdown, and feedwater preheating and degassing, all in one completely automated unit. *Sparkler-Filtrion Corp.*

Circle No. 41 on Readers' Service Card

Spreader

The L-72S Spreader, designed to haul and spread material of a damp and dense consistency, has extra steep sloping sides (about 60°) which facilitates handling of paper mill sludge.

The equipment has laterally reinforced endgates, a 30-in. conveyor chain and 20-in. spinners that uniformly distribute material. The L-72S is available in four different body lengths from 9 to 15 ft. with respective capacities from 5.2 to 8.8 cubic yd. *Highway Equipment Co.*

Circle No. 42 on Readers' Service Card

Vertical fluid mixers

Made in standard models ranging from 1 to 200 hp. and special models up to 500 hp., this line of vertical fluid mixers is equipped with improved gear drives. The

RYKON *Grease*

passed this test at Corn Products Company

Situation: The springs in the grease chargers on expeller machines at Corn Products Company's Argo, Illinois, plant are under extra heavy tension. Due to this tension, oil formerly separated from the grease thickener in the grease cups. Bearings did not receive proper lubrication and the cups filled with grease thickener residue. The system needed cleaning every three months. Each time, large amounts of residue were found. Ten special-purpose greases were tried in an effort to solve the problem.

What was done: A Standard Oil lubrication specialist working with Corn Products' plant maintenance people recommended RYKON Grease #2 E.P. The system now needs cleaning only every six to nine months. Very little residue is found. Now RYKON Grease has become one of the important lubricating greases in use at Corn Products' Argo plant.

RYKON Grease is formulated with a unique non-soap organic thickener. The fibers of this thickener hold RYKON's fine quality base oil firmly in suspension. The grease resists water washing, high temperature and dirt contamination while providing superior lubrication to bearings of all types.

What you can do: Get more facts about RYKON Grease from the Standard Oil office nearest you anywhere in the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Ill.**

You expect more from **STANDARD** *and you get it!*

Standard's Arnold Parus and chief lubrication foreman Henry Anderson take a look at expeller unit's grease system. Arnold Parus is well equipped through experience and training to work with plant men on lubrication problems. Arnold has a B.S. degree from Bradley University and three years' field experience in this kind of work. He has also completed Standard's Sales Engineering School.

Quick facts about **RYKON** *Grease*

- Heat stable. At sustained high temperatures, RYKON Grease remains soft and grease-like.
- Resistant to water washing.
- Mechanically stable. Minimum change in consistency in service.
- Resistant to oxidation. Thickener acts as inhibitor.
- Exceptional rust preventive properties.

POSTERS — A POTENT SAFETY TOOL

Posters should be one of the top aids in your safety program. No other safety medium can reach your entire audience—not once, but many times each day—with such low-cost safety messages. They are directed at the worker acts and worker attitudes that lead to accidents. Posters lend *timeliness, repetition and continuity* to your safety program . . . the three fundamental principles of direct selling.

The National Safety Council maintains a stock of posters that covers all industries, operations and phases of safety and health. These posters are produced in two sizes: "A" size, 8½"x 11½", and "B" size, 17x23". Their colorful illustrations and eye-catching captions make them ideal for the mass selling of safety.

Write for a free copy of the Directory of Occupational Safety Posters. This 72 page catalog illustrates 744 posters, indexed and classified for specific operations.

NATIONAL SAFETY COUNCIL
425 N. Michigan Ave.
Chicago 11, Illinois

New Products . . .

case-hardened, precision-ground gears for the drive system eliminate "running-in" periods which cause wear. The improved gears give the mixer a greater load-carrying capacity and longer life, with reduced sound level and vibration. The mixers are available with either paddle- or turbine-type impellers. *Philadelphia Gear Corp.*

Circle No. 43 on Readers' Service Card

Crawler crane

The Lorain 56, a new 40-ton crane in the 1¼-yd. class, is now available. Mounted on a 14-ft. long, 13-ft.-wide crawler and handling up to 110 ft. of boom, the crane is convertible to dragline, clamshell, crane or hoe as desired. Both crawler and crane are air powered.

Other features of the Model 56 include a torque converter that multiplies engine torque automatically as digging conditions require, a single-race, ball-bearing connection between crawler and crane, and a detachable, rear counterweight for weight reduction during highway transport. *Thew Shovel Co.*

Circle No. 44 on Readers' Service Card

Vinyl ball valves

Available with threaded ends, weld ends or flanges, these rigid vinyl ball valves are self-compensating for changes in pressure or temperature. The valves offer superior resistance to oils, acids, alkalis and most chemicals. For use in piping systems where corrosion has long been a problem, the valves are made of Geon, a vinyl material, except for the seats and seals. Galling or seizure problems are said not to arise and no lubrication is needed. *B. F. Goodrich Chemical Co.*

Circle No. 45 on Readers' Service Card

Pneumatic dial indicator

Primarily designed for panel board installation, the 90K Tanscope dial indicators are compatible in size and appearance with all other Tanscope recording or controlling instrumentation, either electronic or pneumatic.

Economy of the 90K indicators lies in their adaptability and in the availability of multiple options, which may be added to the simple one-pointer indicator to suit individual process needs. *Taylor Instrument Co.*

Circle No. 46 on Readers' Service Card

Cleaning solvents

Available in a series of eleven standard formulations ranging from low-cost 'wash-up' solvents to high safety factor blends for hazardous locations, these cold cleaning solvents are certified not to contain toxic carbon tetrachloride. The formula variation in this new series of solvents permits the industrial user to select the formulation most suitable to his needs according to type of soil to be removed, method of use or application, drying time required and cost range. *Harco Chemical Co.*

Circle No. 47 on Readers' Service Card

Fan units

These ready-to-run, V-belt-driven fan units are available in two models. Type LS Ready Units: 13 sizes available; low-speed, forward-curved multiblade wheels. Type MS: 12 sizes available; medium-speed, backward-inclined blade wheels.

With motor and drive integrated in one assembly, the units can be used for ventilating, spot cooling, supplying process air and exhausting fumes in buildings. *Clarage Fan Co.*

Circle No. 48 on Readers' Service Card

Roller bearing series

Channel-shaped, outer-ring roller bearings, now available, may be applied directly to hardened and ground shafts or used with inner rings, obtainable from the same company. The bearings' boundary dimensions conform to standard AFBMA series NAA and NAB, and are interchangeable with needle bearings made to these standards. *Torrington Co.*

Circle No. 49 on Readers' Service Card

Latex strip coater

This top and bottomside latex strip coater is designed for manufacturers of self-seal paper bands. A wide range of bands can be made on this machine for such diversified products as curtains, stockings, shirts, paper currency, etc. The strip coater will also apply remoistenable glue to one side of the material being processed, thus permitting the production of labels, window streamers, tape, etc. *Potdevin Machine Co.*

Circle No. 50 on Readers' Service Card

The Paper Industry
Professional and Business Services

J. E. SIRRINE COMPANY
ENGINEERS Since 1902
GREENVILLE, SOUTH CAROLINA

Design — Consultations
Paper & Pulp — Reports
Water & Waste — Appraisals
Steam & Hydro Power — Steam Utilization

NEW LITERATURE

Books

TECHNIQUES OF PLANT MAINTENANCE & ENGINEERING (Vol. 10). Published by Clapp & Poliak Inc., 341 Madison Ave., New York 17. Pages: 266. Price: $10 postpaid.

The new volume contains all papers read at the 1959 Plant Maintenance & Engineering Conference held in Cleveland, Ohio, last January. One of the major features of the book is the large number of practical situations it covers. Included are answers to 1056 questions submitted by engineers who attended the conference. More than 70 charts, graphs and diagrams are reproduced.

Particularly valuable are session reports pertinent to single industries. These include discussions on research and development laboratories, abrasive-product plants, pulp and paper mills, assembly plants, chemical plants and electrical manufacturing plants, etc.

CREATING WITH PAPER. Written by Pauline Johnson, Associate professor of Art Education, University of Washington. Published by University of Washington Press, 111 Thompson Hall, University of Washington, Seattle 5, Wash. Pages: 225. Price: $6.50.

The authoress considers paper as an art medium from which two- and three-dimensional forms can be created. The purpose of the book is to create awareness of esthetic values in terms of contour, plane, volume and space.

Paper is contrasted as a utilitarian and as an expressive medium. In the book, techniques of folding, cutting, bending and shaping paper into abstract or representational forms are shown. This is followed by a discussion of advanced problems of paper design, with illustrative material to inspire emulation rather than imitation. The book also shows how paper can be used in holiday, festival and party decorations.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Revised catalog insertions

Morden Machines Co. has published a revision of page 10-10-30 for the Morden catalog. Revised pages 50-10-30-HD and 60-10-30-HD of the catalog, describing redesigned refiner and jordan units, are to be inserted as replacements of pages 50-10-30 and 60-10-30.

Circle No. 51 on Readers' Service Card

Pulp and paper brighteners

Antara Chemicals, a sales div. of General Aniline & Film Corp., announces the availability of a new data sheet on Blancophor ES-31 & 73. The technical folder describes properties and usage of these new fluorescent brighteners for pulp and paper.

Circle No. 52 on Readers' Service Card

Three catalogs

Jeffrey Mfg. Co. has announced the availability of three catalogs as follows: No. 941—a 48-page catalog that presents the entire company line of equipment for weighing, batching and proportioning systems (photos, drawings and charts illustrate copy); No. 951—a 56-page catalog on the company's spiral conveyor line that offers engineering data, conveyor layouts, capacity tables, conveyor selection and horsepower selection (illustrated with photos, drawings and tables); No. 978—a 12-page brochure that reviews equipment for the process industries. Feeders, conveyors, coolers, dryers, vibrating screens, bin check valves, etc. are outlined. Specific equipment catalogs are available for each unit described in this general book.

Circle No. 53 on Readers' Service Card

Extrusion coating

Dilts Div. of Black-Clawson Co. Inc. has just published a reprint of an illustrated article entitled, "Equipment for Extrusion Coating." The eight-page bulletin gives information on equipment needed and variable, individual company requirements to be considered in choosing the correct machinery.

Circle No. 54 on Readers' Service Card

Bearing blocks and takeups

Link-Belt Co. has published a new 16-page book giving full information on their complete line of babbitted, bronze and plain-bore bearing blocks and takeups. Additional new sizes, in eight series, are announced in this book which gives complete specifications, including details, dimensions, weights, and diagrams showing recommended loading ranges.

Circle No. 55 on Readers' Service Card

Wood tank engineering

Arrow Tank Co. Inc. welcomes your request for their new 31-page handbook on wood tank engineering. This handbook assists the engineer in selecting species and grades of lumber to be used in the manufacture of wood tanks. It contains information on chemical resistance of woods, round and rectangular tank design, foundations, maintenance and care of wood tanks, impregnated and plastic lined tanks, etc.

Circle No. 56 on Readers' Service Card

Ring-type debarker

Carl W. Mullis Engr. & Mfg. Co. has published an eight-page brochure which describes their Thin-line log skinner. Information is given on maintenance and operation, exclusive patented features and model specifications. The brochure also contains many blow-up and cutaway illustrations of various machine parts and sections.

Circle No. 57 on Readers' Service Card

High-pressure gages

Jerguson Gage & Valve Co. welcomes your request for the new technical data sheet on their line of Refraport gages, designed for high-pressure boiler water service. The illustrated and diagrammed bulletin also includes information on maintenance procedures.

Circle No. 58 on Readers' Service Card

Bio-oxidation aerator

Permutit Co., Div. of Pfaudler Permutit Inc., has published a six-page bulletin that describes the advantages of the Permaerator, suitable for use in most all aeration systems. Diagrams and charts illustrate various design features of the unit and show how it is operated.

Circle No. 59 on Readers' Service Card

Paper-coating latex

Plastics Div. of Koppers Co. Inc., through a new technical bulletin, announces its newest latex for pigmented paper coatings. Designated as Dylex Latex KCD-154, it is reported to have up to 50-per cent increased film strength, which results in better pigment binding and increased pick resistance of the coated sheet.

Circle No. 60 on Readers' Service Card

Chlorophen usage

Reichhold Chemicals Inc. has just published a technical bulletin on the uses of Chlorophen (sodium pentachlorophenate). Available in both powdered and pellet form, Chlorophen is described in terms of its application in the lumber and adhesive industries and its use in slime control.

Circle No. 61 on Readers' Service Card

Wire-stitching machine coil holders

Acme Steel Co. announces a new illustrated folder on uniform-feed stitching machine coil holders with a non-tangle automatic brake. The folder explains the advantages of coil holders for up to 50-lb. coils. The folder also includes a handy chart for finding the number of stitches produced per pound of wire, depending on the size of the wire and the length of the stitch.

Circle No. 62 on Readers' Service Card

Construction and maintenance

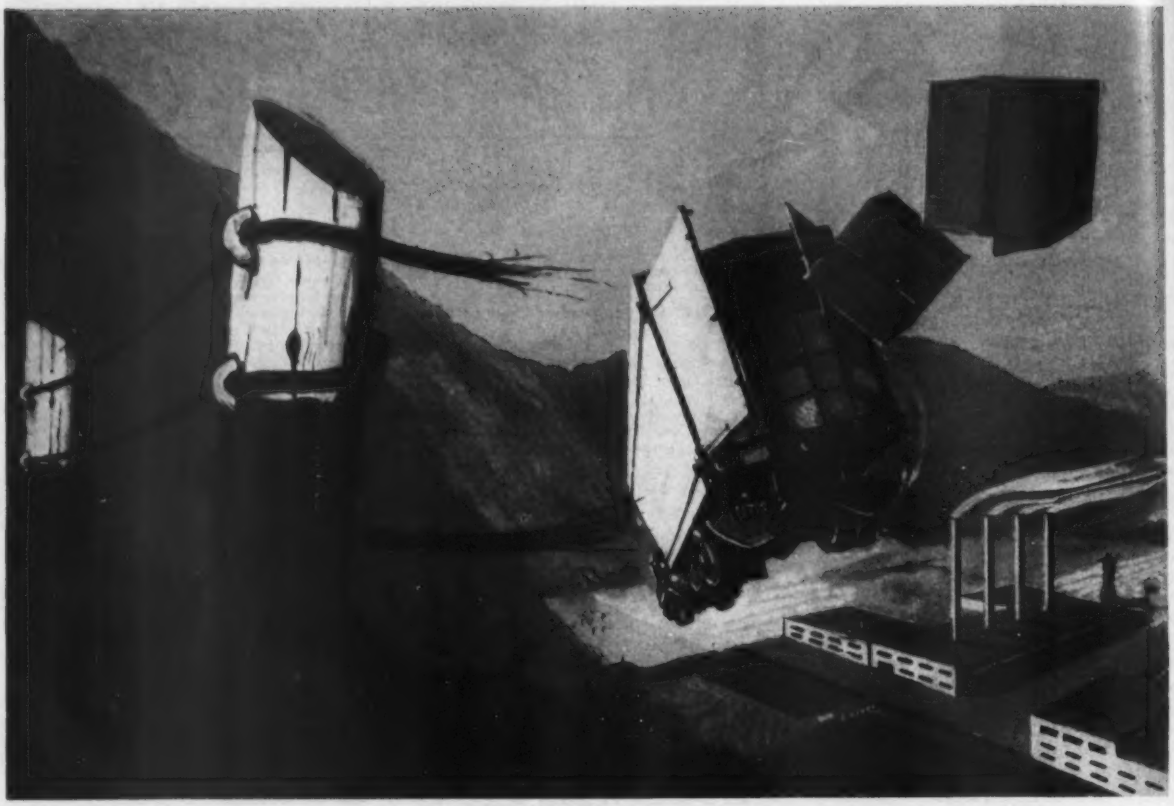
Building Products Div. of L. Sonneborn Sons Inc. has published a 1959 building construction and maintenance handbook which contains data on many building products. This 128-page booklet contains engineering data and specifications to help solve many problems of waterproofing, damp-proofing, painting, caulking, etc. The handbook devotes 36 pages to tables and charts, materials, an estimating guide, weights and measures, etc.

Circle No. 63 on Readers' Service Card

Pressurized refiners

Sprout, Waldron & Co. Inc. has announced the availability of a new bulletin on its 30 and 42 in. pressurized refiners. Designated as Bulletin 212, it covers the design, construction and operation of the "unique" Sprout-Waldron balanced-thrust pressurized refiner with parallel feed arrangement. A two-color diagrammatic view visually explains the mechanism of the free-floating, rotating, twin refining disc assembly. Besides close-up photos, cutaway views and diagrams, the bulletin has a simplified dimensional drawing with a list of specifications.

Circle No. 64 on Readers' Service Card



HOW A HIGHWAY ACCIDENT CLEANED A STOCK PREPARATION SYSTEM!

Skidding across the highway, a giant trailer truck crashed through the guard rail of a New England turnpike, spilling thousands of gallons of LESTOIL Liquid Detergent down the mountainside. The driver escaped with only minor cuts and bruises, but the LESTOIL found its way into the water supply of a nearby paper mill.

Unknown to the mill production staff, the LESTOIL "solution" flowed through intake pipes, and thence through the entire stock preparation system.

THE RESULT: scale, slime, mineral salts and dirt which had accumulated in the pipes — emulsified by the LESTOIL — flowed out of the head boxes onto the paper machine. This unscheduled cleaning naturally curtailed production, but the plant superintendent was really impressed with the thorough cleaning job done by LESTOIL.

We don't recommend such drastic treatment to test d-i LESTOIL (our special paper mill formula). But, used periodically as a system cleaner, d-i LESTOIL does the job quickly and efficiently. And used regularly in your pulping or rag cooking processes, d-i LESTOIL will not only de-ink, de-wax and de-grease your raw stock, but will also prevent soil deposits from forming in your system and help you maintain top production.

d-i LESTOIL LIQUID DETERGENT

For a generous, free sample and detailed information, write to:

LESTOIL, INC. HOLYOKE, MASS.
912 Garfield Street a subsidiary of Adell Chemical Co.

CLASSIFIED ADVERTISING

RETIRING?

Add to your retirement income by making your paper mill knowledge pay off. Spare time. No selling. Write Box 690, The Paper Industry.

CHEMIST Or
CHEMICAL ENGINEER
$7000-8000

For customer service & laboratory development work on base products for paper mfg. & converting applications. National chemical co., central N. J. laboratories. 30% travel. Write education & experience in detail to Box 692, The Paper Industry.

Two openings in Engineering Department of specialty mill located in Western Massachusetts.

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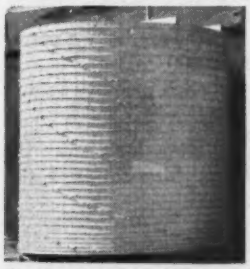

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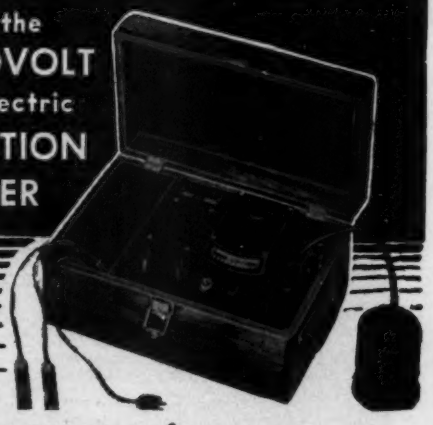

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After two years of tough work Jones Double-D Super-Stainless discs show only .065" wear — evenly distributed and with parallelism perfectly retained.

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Sept. 7, 1957 was the day St. Regis began to produce their fine quality Seminole Chief Board in Jacksonville — with the help of ten Jones Double-D's for both primary and secondary refining. Regular six month checks of the Jones Super Stainless discs in each Double-D show a maximum wear of only .0027" per month. Applied against the available disc wear of .750", this actually indicates a disc life of more than 23 years!

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MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.
No. 1 white shirt cuttings	13.00— 13.50
Soft unbleached muslins	15.50— 16.00
Fancy shirt cuttings	4.50— 5.00
No. 1 percales	5.50— 6.00
No. 1 washables	2.25— 2.50
No. 1 light sliesias	6.50— 7.00
No. 1 light prints	4.75— 5.00
Light flannelettes	6.50— 7.00
Cottonades	2.75— 3.25
Blue overall cuttings	6.75— 7.25
Blue cheviots	6.75— 7.25
Canton flannels, bleached	10.50— 11.00
Canton flannels, unbleached	10.50— 11.00
Osnaburg cuttings	9.50— 10.50
underwear cuts, bleached	14.50— 15.00
Underwear cuts, unbleached	14.50— 15.00
Sun tan khaki cuttings	5.00— 5.50
American linen cuttings	6.75— 7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b New York:

	per cwt.
No. 1 roofing (Chicago)	.65— .75
No. 2 roofing (Chicago)	.55— .65
Twos and blues, repacked	1.50— 1.75
Thirds and blues, repacked	1.50— 1.75
No. 1 whites, repacked	—
No. 1 whites miscellaneous	—
No. 2 whites, repacked	—
No. 2 whites, miscellaneous	—

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt.

Nominal

- New dark cuttings
- New mixed cuttings
- New light sliesias
- Light flannelettes
- Unbleached cuttings
- New white cuttings
- New light oxfords
- New light prints

Old Rags

per cwt.

Nominal

- No. 1 white linens
- No. 2 white linens
- No. 3 white linens
- No. 4 white linens
- No. 1 white cottons
- No. 2 white cottons
- No. 3 white cottons
- No. 4 white cottons
- Extra light prints
- Ordinary light prints
- Medium light prints
- Dutch blue cottons
- French blue cottons
- French blue linens
- Checks and blues
- Linsey garments
- Dark cottons
- Old shopperies

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	—
Gunny No. 1, foreign	—
No. 1 manila rope, domestic	—
No. 1 manila rope, foreign	—
New burlap cuts (soft)	—
Sisal strings	—
Mixed strings	—

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	90.00—100.00
No. 1 hard white shavings	75.00— 80.00
No. 1 soft white shavings	50.00— 55.00
Soft white shavings, uncoated	60.00— 65.00
Fly leaf shavings No. 1	30.00— 35.00
Fly leaf, woody, No. 1	25.00— 27.50
Mixed colored shavings	21.00— 23.00
No. 1 books and magazines	24.00— 25.00
Ledger stock, white, No. 1	52.50— 55.00
Ledger stock colored, No. 1 (Midwest ship)	40.00—
New manila envelope cuttings (free of groundwood)	70.00— 75.00
New manila envelope cuttings (containing groundwood)	50.00— 55.00
Manila tab cards	75.00— 80.00
Colored tab cards	55.00— 60.00
New northern kraft envelope cuttings	65.00— 70.00
Triple sorted kraft, 100%	35.00— 37.00
No. 1 old kraft	30.00—
White news cuts, No. 1	60.00— 65.00
No. 1 overissue news	17.00— 19.00
Folded news, special	15.00— 16.00
Folded news, ordinary	13.00— 14.00
Old corrugated boxes	22.00— 23.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	11.00— 13.00
Boxboard cuttings	7.00— 9.00
No. 1 mixed paper	10.00— 12.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt.	5.05—
Powdered, drums, works, cwt.	5.20—
1-Arginine, drums, kilo	90.00—
Blanc Fixe	
Direct process, bags, c.l., works, ton	145.00—
L. c. l., ton	155.00—
Bleaching Powder, drums, cwt.	—
Casein, domestic acid precipitated	
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.56—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.64—
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh bags, c.l., Georgia works, ton	10.00— 12.00
300-mesh bags, c.l., Georgia works, ton	13.50— 14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00— .35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt.	3.15—
Glycerine, refined	
(CP, USP) 99%, drums c. l., delivered lb.	.30⅞—
Litharge, commercial powdered	
Barrels, c. l., works, freight equaled lb.	.14¾—
Rosin, gum, c. l., f.o.b. New York, cwt.	
K, M	11.40—
N	11.50—
WG	12.25—
WW	12.50—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M.	9.65—
N	9.85—
WG	10.05—
WW	10.35—
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c.l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—
Solid, 76%, drums, c. l. works, cwt.	4.80—
Sodium Silicate	
40°Be, 1:3.2, turbid, drums, c. l., works, cwt.	1.65—
52°Be, turbid, 1:2.4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	7.51—
Pearl, 100-lb. bags, cwt.	7.36—
Powdered, 100-lb. paper bags, cwt.	7.48—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	23.50—
Talc	
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment	
Calcium-rutile base, regular, bags, c. l., lb.	.09½—
High-tinting, drums, c. l., lb.	.14½—
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l. freight allowed, lb.	.14½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.15½—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	155.00—
Bleached sulfite, Canadian	155.00—
Unbleached sulfite	135.00—
Unbleached sulfite, Canadian	135.00—
Bleached soda	150.00—
Bleached soda, Canadian	150.00—
Kraft, bleached hardwood	152.00—
Kraft, bleached	157.00—
Kraft, bleached southern	160.00—
Kraft, bleached Canadian	160.00—162.50
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft semi-bleached southern	—
Sulfite screenings	—
Sulfate screenings	—

Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite Swedish, freight allowed	155.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155.00—
Bleached sulfite, Finnish, freight allowed	155.00—
Unbleached sulfite, Swedish, freight allowed	135.00—
Unbleached sulfite, Finnish, freight allowed	135.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	157.50—162.50
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single lute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50

Book Paper (f.o.b. Chicago, c.l. cases per cwt):	
No. 1 enamels	20.55
No. 2 enamels	19.55
Machine-coated, 45- to 100-lb.	15.55— 19.00
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	22.25
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	21.10

Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	—
75% "	—
50% "	—
25% "	—

Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):	
100% rag	—
75% "	—
50% "	—
25% "	—

Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—

Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—

Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials

Kraft Wrapping — Natural (standard rolls 9- and 15-in. diam.)	per cwt
70-lb. and heavier	8.75
60-lb.	9.00
50-lb.	9.25
40-lb.	9.50
35-lb.	10.00
30-lb.	10.75
25-lb.	11.50
20-lb.	12.50

No. 1 Kraft Butcher — Pink	per cwt
40-lb. only	10.25

(Sheets — Plus 50c cwt)

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Faster blow

Valve by valve comparisons show Yarway Seatless have up to 100% greater discharge area than some other digester blow valves of the same nominal pipe size. Result—faster discharge, lower pressure drop.

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Yarway's tight seal (spring-loaded packing rings above and below inlet port) prevents loss of cooking liquor and insures thorough cooking of pulp.

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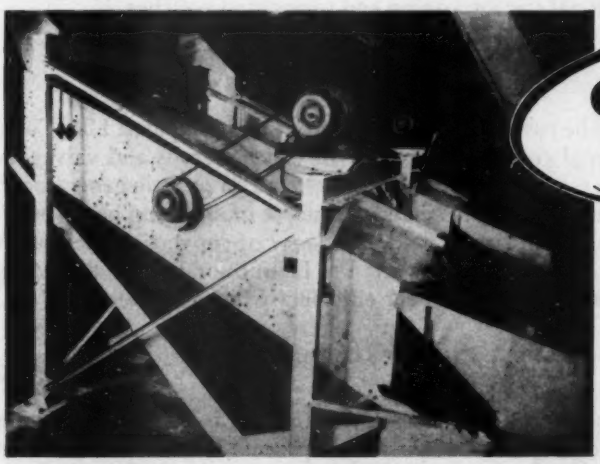

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Complete with woven-wire steel screens of suitable mesh, suspension frame with legs for floor mounting, feed tray, V-belt drive and motor base frame. Also furnished with suspension rods, springs, and brackets arranged for overhead installation.

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PAPER INDUSTRY

Whither?

. . . in production, processes, new products, markets

New results in the use of glass fibers in paper

Experiments conducted on the use of glass fibers in paper making (fibers of ¼-in. length and 9 microns dia.) show that these fibers increase drainage, improve wet strength and drying rate, reduce shrinkage on the machine, increase dimensional stability, increase porosity, and increase tear resistance. It is also reported that a 20 per cent reduction in basis weight has been achieved by the use of glass fibers without sacrificing opacity.

On the negative side are the observations that sheet formation is not improved and that most of the advantages gained by the addition of glass fibers to paper stock are eliminated by calendering.

Cellophane sales to break all records in 1960

The cellophane industry is expected to produce a record-breaking 455 million pounds of cellophane film in 1960, according to Harold J. Michel, vice president of American Viscose Corp. This compares with approximately 435 million pounds produced in 1959. Mr. Michel further anticipates that packaging design in 1960 will be focused more on convenience and portion packaging, variety packs, fractional size packaging and segmented pouches.

Electric power from hot gases

The trend seems to be toward the elimination of moving parts. Like Curtiss-Wright's new internal combustion engine in which pistons and valves have been eliminated, so General Electric has developed an electric generator that has no moving parts and operates on the principle of speeding hot (5000° F) ionized gases through a magnetic field. Efficiency of converting thermal into electric energy by this method is expected to be in the range of 40 to 50 per cent This compares with a 35 per cent efficiency in turbo-generators.

Acrylonitrile used in cyanoethylation of pulp

Acrylonitrile, as announced by American Cyanamid, is being used commercially to modify the properties of pulp by a process known as cyanoethylation. Improved paper properties resulting from this process include greater resistance to heat deterioration, prolonged retention of dielectric and tensile strength, improved resistance to rot and acids, and greater dimentional stability.

Increased newsprint consumption

The current rate of newsprint consumption indicates a 7.5 per cent increase over that of 1958. This points to a consumption of some 150,000 tons over the anticipated 1959 consumption and it may mean that present capacity of 9,900,00 tons may be completely absorbed by 1963.

an Invitation TO PAPER COATERS

to explore
the possible advantages,
both physical and economic,
of using animal bone glue
as the adhesive in paper coating

ANIMAL GLUE, once used as the adhesive in paper coatings, is back in the picture. Improved glue qualities and new coating formulations have shown definite advantages—substantiated by laboratory evaluation, a full-scale paper mill trial, and actual printing tests.

For a more detailed announcement of this development (printed on glue-coated paper), a technical bulletin describing the method used, or samples of DARLING's coating grade glue, write:

DARLING & COMPANY
GLUE DIVISION
4201 South Ashland Avenue • Chicago, Illinois

DARLING'S
improved BONE
GLUE

for

PAPER COATING ADDITIVES

ATLAS 239

Atlas 239 is a skilful blend of plasticizing lubricants with surface active agents designed especially for plasticizing adhesive films in coating formulations.

The use of Atlas 239 in a coating mixture imparts unusual flexibility to the adhesive film without impairing adhesion. This improved film flexibility tends to eliminate dusting on the calenders, yet it has no effect on the drying effort.

Atlas 239 is a smooth, soft, white paste. It is readily dispersible in water. It can be added to the coating slurry in early or late stages of mixing, although Atlas 239 must be mixed in thoroughly to "smooth out" the coating compound.

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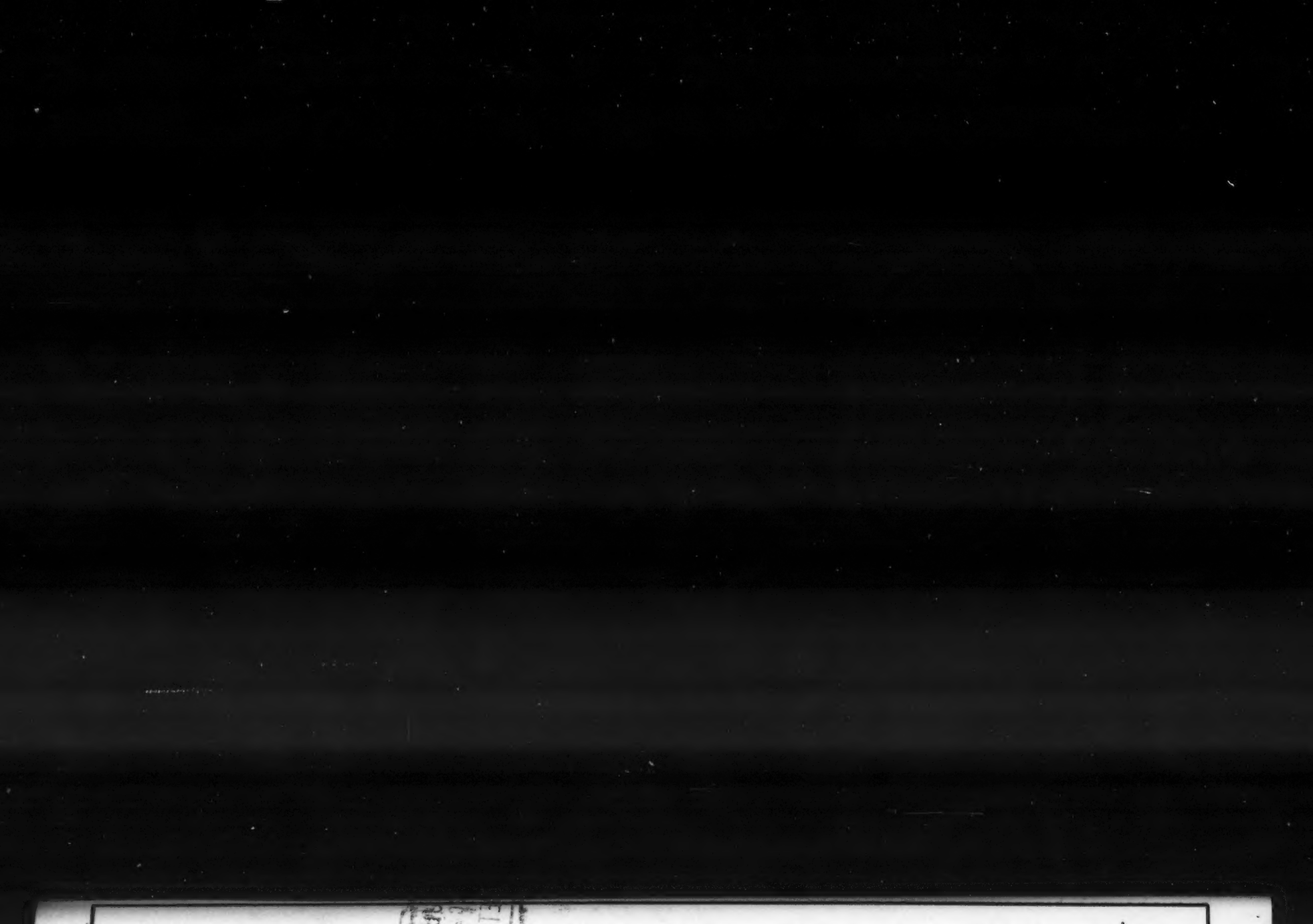
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